PUMA 2100/2600/3100 series

High-Performance Turning Center
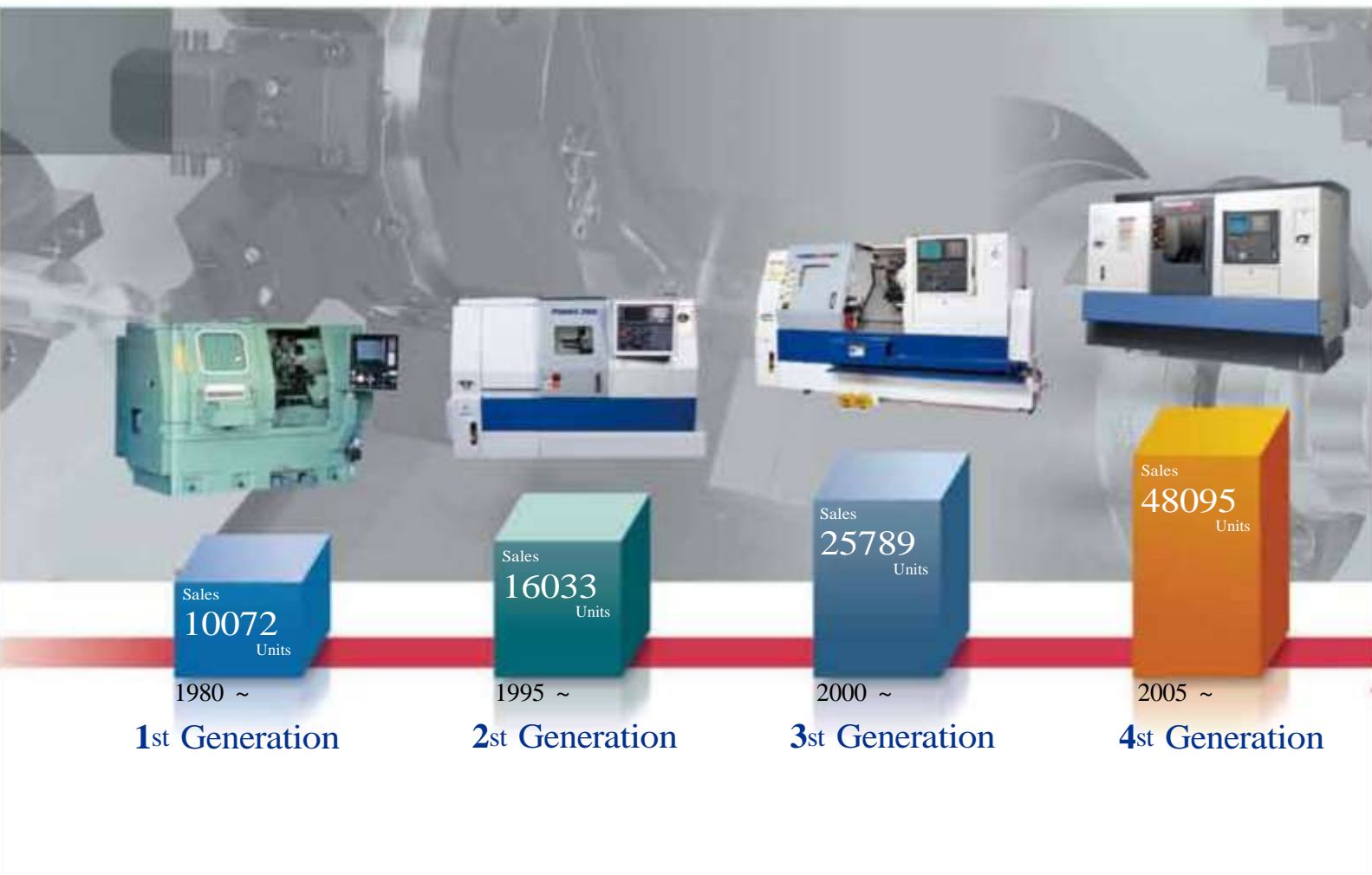

Doosan Machine Tools

Optimal Solutions for the Future

High-Performance Turning Center

PUMA 2100/2600/3100 series has been developed to create full line up of high level 8" to 12" size with model variations from 2 axis to Y axis and sub spindle.

PUMA 2100/2600/3100 series

Sales
10072
Units

1980 ~
1st Generation

Sales
16033
Units

1995 ~
2st Generation

Sales
25789
Units

2000 ~
3st Generation

Sales
48095
Units

2005 ~
4st Generation

High Performance + Wide Variation + Easy Operation

2010 ~
NEW PUMA series

High Performance

These Doosan machines offer a high level of machining capability
to provide optimum productivity for the customer.

PUMA 2100/2600/3100 series

Rigid bed

Today's high speed / high acceleration, deceleration feed drives impose severe impact forces on the machine tool structure. This causes low frequency / large amplitude vibration which can cause deterioration in surface finish and contour definition during finish machining. Doosan's enhanced structural stability reduces the effects of vibration and provides the optimum conditions for producing unsurpassed workpiece quality.
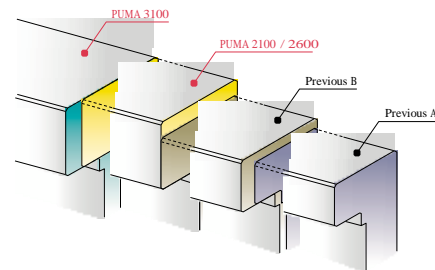
Larger than previous

Max. 158 %
(PUMA 2100 / 2600)

Max. 154 %
(PUMA 3100)

Previous
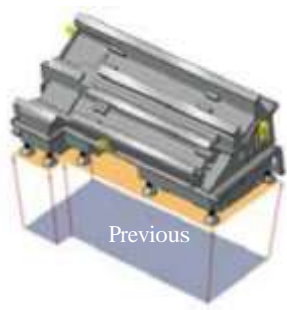
bed guide way width

For structural stability, the guide way width and span are enlarged by 25%~50%, so that high precision in cutting is ensured.
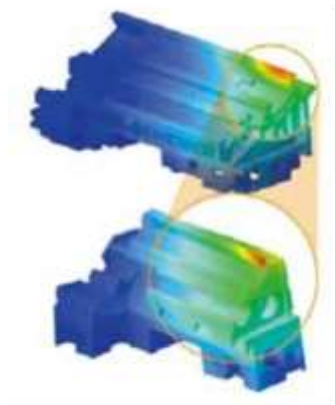
PUMA 3100
PUMA 2100 / 2600
Previous B
Previous A

Stiffness
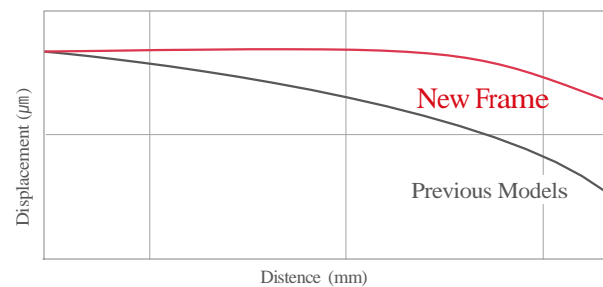
Static and Dynamic rigidity of the new PUMA

machines have been enhanced in structural

the previous model.

Guide way deformation

Displacement (μm)

New Frame

Previous Models

Distence (mm)

Static stiffness is 3 times higher than previous

• PUMA 2100SY core machine

Main Spindle

Increased mounting area of headstock base to the bed

The spindle headstock has increased rigidity due to the wide surface contact between the headstock and bed way for Heavy duty cutting, Optimum surface finish, High cutting speeds, Highly accurate roundness.

larger area than previous

Max. **190** %
(in the same class)

Previous

Sub Spindle

Mounting base area is

50 % ~ **94** %

larger than previous

Previous Model
135 / 170 mm
(5.3 / 6.7 inch)

Chuck size ▼

PUMA 2100 / 2600
175 mm
(6.88 inch)

Previous

Tooling System (On Turn-Milling)

The turret accommodates BMT55P or BMT65P tooling in which the toolholders are mounted directly to the turret's periphery with 4 large bolts. This type of mounting system BMT55P is standard on PUMA2100 turn-milling models and BMT65P is standard on PUMA2600 and PUMA3100 turn-milling models. BMT65P is available on PUMA2100 as an option.

Max. rotary tool spindle speed
5000 r/min

Max. rotary tool spindle power
5.5 kW (7.3 Hp), 15 min.
{7.5 kW (10.1 Hp), 5 min.} opt.

Max. rotary tool spindle torque
47 N·m (34.6 ft-lbs)
{95.5 N·m (70.4 ft-lbs)} opt.
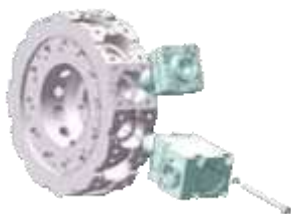
Saddle

The broad width and long contact span of the saddle slideway ensures stability of the support structure. This coupled with the optimised spindle and bed design provides heavy duty and accurate machining capability.

Saddle guide width and span are increased in a range from

Max. **30** % to **46** %
compared with previous

Previous

Machining Capacity

More powerful revolving motor is adapted to improve the productivity.

End mill
Carbon steel (SM45C)

	Unit	PUMA 2100 BMT55P	PUMA 2600 BMT65P
Chip removal rate	cm³/min (inch³/min)	90 (35.43)	105 (41.34)
Tool Dia.	mm (inch) mm	18 (0.71)	20 (0.79)
Cutting Depth	(inch) mm/min	20 (0.79)	21 (0.83)
Feedrate	(ipm)	250 (9.8)	250 (9.8)

Tapping
Carbon steel (SM45C)

	Unit	PUMA 2100 BMT55P	PUMA 2600 BMT65P
Rotary tool spindle speed	r/min	240	240
Tap Size		M20 x P2.5	M24 x P3
Feedrate	mm/min (ipm)	600 (23.6)	600 (23.6)

Face mill
Carbon steel (SM45C)

	Unit	PUMA 2100 BMT55P	PUMA 2600 BMT65P
Chip removal rate	cm³/min (inch³/min)	41.9 (16.49)	53.9 (21.22)
Tool Dia.	mm (inch)	63 (2.48)	63 (2.48)
Cutting Depth	mm (inch)	3.5 (0.14)	4.5 (0.18)
Feedrate	mm/min (ipm)	190 (7.5)	190 (7.5)

O.D turning
Carbon steel (SM45C)

	Unit	PUMA 2100	PUMA 2600
Chip removal rate	cm³/min (inch³/min)	528 (207.87)	616 (242.52)
Cutting Depth	mm (inch)	4.3 (0.17)	5.0 (0.2)
Feedrate	mm/rev (ipr)	0.55 (0.022)	0.55 (0.022)

U-Drill dia. 63 mm (2.5 inch)
Carbon steel (SM45C)

	Unit	PUMA 2100	PUMA 2600
Chip removal rate	cm³/min (inch³/min)	472 (185.83)	630 (248.03)
Feedrate	mm/min (ipm)	0.15 (0.006)	0.2 (0.008)

Grooving
Carbon steel (SM45C)

|	Unit	PUMA 2100	PUMA 2600
Chip removal rate	cm³/min (inch³/min)	169 (66.54)	241 (94.9)
Cutting Depth	mm (inch)	8 (0.31)	8 (0.31)
Feedrate	mm/rev (ipr)	0.14 (0.006)	0.2 (0.008)

· The results indicated in this catalogue are provided as example.
  They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.
· Turing results are obtained in the condition of standard motor.

Accuracy

Doosan offers its customers unsurpassed levels of accuracy by applying the latest design techniques and rigorous testing processes.

Roundness

Machine	PUMA 2600SY [Belt-driven]
Tool	TNMG16404R-W [Nose radius 0.4mm]
Workpiece	ø60 x L50 (ø2.4 x L2.0 inch) Carbon steel [SM45C]
Spindle Speed	3500 r/min
Cutting Depth	0.025 mm (0.001 inch)
Feedrate	0.025 mm/rev (0.001 ipr)

0.5μm
(0.02 μinch)

test model
PUMA 2600SY
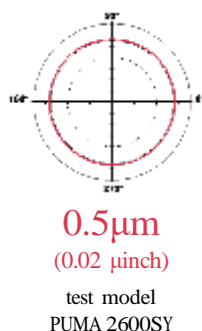
Users enjoy stable performance in all types of operations from heavy-duty cutting to high speed machining.

Work material	Aluminum (AL2024)
Cutting speed	250 (9842.5) m/min (ipm)
Feedrate	0.08 (0.003) mm/rev (ipr)
Cutting depth	0.2 (0.008) mm (inch)
Tool	Diamond [nose R0.8]

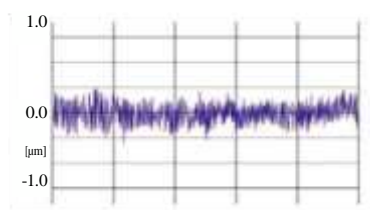| PUMA 2600SY	0.5
Current PUMA	3.2

Roughness

Ra 0.11μm
(Ra 0.004 μinch)

Rz 0.83μm
(Rz 0.033 μinch)

Rmax 0.92μm
(Rmax 0.036 μinch)

Material	Carbon steel (SM45C)
Work Size	ø60 x L50 mm (ø2.4 x L2.0 inch)
Spindle speed	3500 r/min
Feed	0.025 mm/rev (0.001 ipr)
Depth	0.025 mm (0.001 inch)
Holder	PTGNR2020 M16
Insert	TNMG160404 R-W (R0.4)

Heat elimination layout

One very important design concept is to reduce the effects of heat sources in the machine. Heat shields and fan motors are used to prevent the transmission of heat to the machine structure.

Rotary tool motor

Electrical cabinet

Hydraulic cylinder

Hydraulic power unit
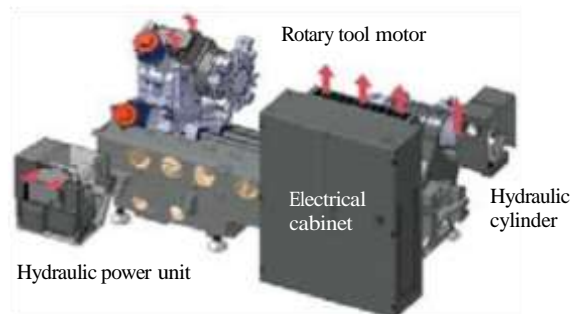
Coolant chiller opt.

Thermal displacement and dimensional accuracy are greatly influenced by oil temperature in a machine. Coolant Temperature Control unit prevents the coolant from heating. Especially, when using oil-based coolant, the oil temperature can become extremely high.

It is useful to prevent coolant temperature increase using oil-based coolant or high pressure coolant (over 2.2kW pump)
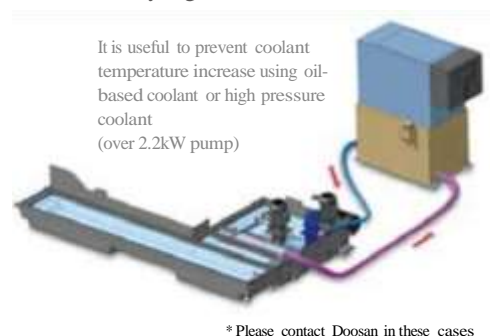
* Please contact Doosan in these cases

Inertia estimates function for C-axis std.

This function can estimate the C-axis inertia which is affected by variation in workpiece weight. It is possible to optimise the Velocity Gain and Acc/Dec Time Constant and therefore improve the C-axis accuracy.

Wide Variation

A wide variety of machine specifications from 2-axis models to turning centers with sub spindles is available to meet your production requirements.
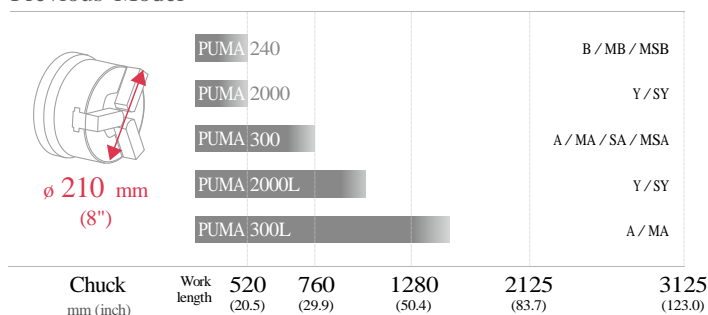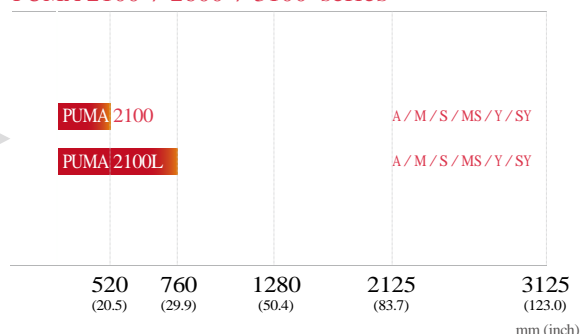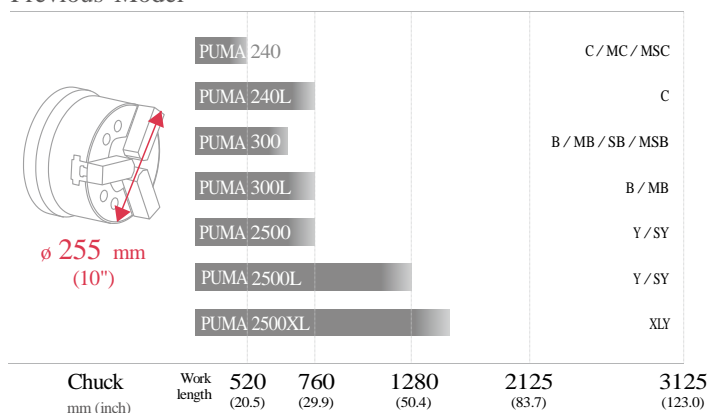
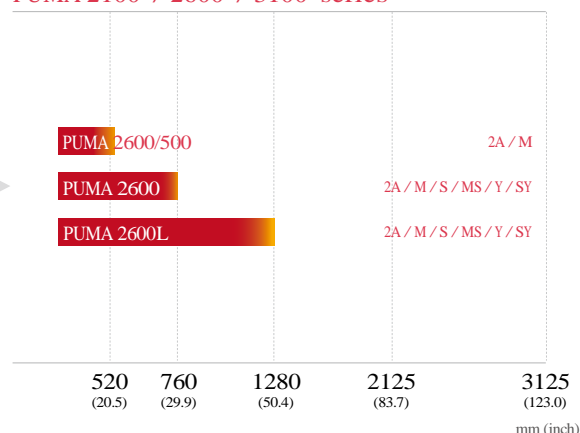## PUMA 2100/2600/3100 series

Previous Model

ø 210 mm (8")

Chuck / Work length mm (inch)	PUMA model	Spec
	PUMA 240	B / MB / MSB
	PUMA 2000	Y / SY
	PUMA 300	A / MA / SA / MSA
	PUMA 2000L	Y / SY
	PUMA 300L	A / MA

520 (20.5) 760 (29.9) 1280 (50.4) 2125 (83.7) 3125 (123.0)

PUMA 2100 / 2600 / 3100 series

PUMA model	Spec
PUMA 2100	A / M / S / MS / Y / SY
PUMA 2100L	A / M / S / MS / Y / SY

520 (20.5) 760 (29.9) 1280 (50.4) 2125 (83.7) 3125 (123.0) mm (inch)

Previous Model

ø 255 mm (10")

PUMA model	Spec
PUMA 240	C / MC / MSC
PUMA 240L	C
PUMA 300	B / MB / SB / MSB
PUMA 300L	B / MB
PUMA 2500	Y / SY
PUMA 2500L	Y / SY
PUMA 2500XL	XLY

Chuck / Work length mm (inch)
520 (20.5) 760 (29.9) 1280 (50.4) 2125 (83.7) 3125 (123.0)

PUMA 2100 / 2600 / 3100 series

PUMA model	Spec
PUMA 2600/500	2A / M
PUMA 2600	2A / M / S / MS / Y / SY
PUMA 2600L	2A / M / S / MS / Y / SY

520 (20.5) 760 (29.9) 1280 (50.4) 2125 (83.7) 3125 (123.0) mm (inch)

Previous Model

ø 305 mm (12")

PUMA model	Spec
PUMA 300	C / SC / MC / MSC
PUMA 300L	C / MC
PUMA 400	A / MA
PUMA 400L	A / MA
PUMA 400XL	A / MA

Chuck / Work length mm (inch)
520 (20.5) 760 (29.9) 1280 (50.4) 2125 (83.7) 3125 (123.0)

PUMA 2100 / 2600 / 3100 series

PUMA model	Spec
PUMA 2600B	2A / M / S / MS / Y / SY
PUMA 2600LB	2A / M / Y
PUMA 3100	2A / M / Y
PUMA 3100L	2A / M / Y
PUMA 3100XL	2A / M / Y
PUMA 3100UL	2A / M / Y

520 (20.5) 760 (29.9) 1280 (50.4) 2125 (83.7) 3125 (123.0) mm (inch)

Turn-milling M

Sub spindle S

Y-axis Y

PUMA 2100

Turning				Turn-milling			
std.	L	S	LS	M	LM	MS	LMS
				Y	LY	SY	LSY

Max. work length		mm (inch)	520 / 760 [L] (20.5 / 29.9 [L])
Chuck [Main / Sub]		mm (inch)	210 / 175 (8 / 6)
Max. turning dia.		mm (inch)	480, 406[1) {376 [2)} (18.9,16.0[1)] {14.8[2)]})
Travel	X-axis	mm (inch)	260 (10.2)
	Z-axis	mm (inch)	590 / 830 [L] (23.2 / 32.7 [L])
	Y-axis	mm (inch)	105 <±52.5> (4.1<±2.1>)

{ } : Option

PUMA 2600*

Turning				Turn-milling							
std.	L	S	LS	M	LM	MS	LMS	M/500	MB	LMB	MSB	LMSB
/500	b	LB	Sb	LSB	Y	LY	SY	LSY	YB	LYB	SYB	LSYB

Max. work length		mm (inch)	520 (500 machine) / 760 / 1280 [L] (20.5 / 29.9 / 50.4 [L])
Chuck [Main / Sub]		mm (inch)	255 / 175 (10 / 6)
Max. turning dia.		mm (inch)	480, 376[2)] (18.9, 14.8[2)])
Travel	X-axis	mm (inch)	260 (10.2)
	Z-axis	mm (inch)	590 (500 machine) / 830 / 1350 [L] (23.2 / 32.7 / 53.1 [L])
	Y-axis	mm (inch)	105 <±52.5> (4.1<±2.1>)

* : PUMA 2600B Chuck size: 305 mm (12.0 inch)

{ } : Option

PUMA 3100

Turning				Turn-milling			
std.	L	XL	UL	M	LM	XLM	ULM
				Y	LY	XLY	ULY

Max. work length		mm (inch)	760 / 1280 [L] (29.9 / 50.4 [L])
			2125 [XL] / 3125 [UL]
			(83.7 [XL] / 123.0 [UL])
Chuck [Main]		mm (inch)	305 (12)
Max. turning dia.		mm (inch)	525, 420[3)] (20.7, 16.5[3)])
Travel	X-axis	mm (inch)	293 (10.2)
	Z-axis	mm (inch)	830 / 1350 [L] / 2190 [XL] / 3190 [UL]
			(32.7 / 53.1 [L] / 86.2 [XL] / 125.6 [UL])
	Y-axis	mm (inch)	130 <±65> (5.1 <±2.6>)

{ } : Option

1) : PUMA 2100M [LM] / MS [LMS] / Y [LY] / SY [LSY]
2) : PUMA 2100, 2600M [LM] / MS [LMS] / Y [LY] / SY [LSY]
3) : PUMA 3100M/LM/XLM/ULM/Y/LY/XLY/ULY

Machining range

We have added a high-rigidity bed and special functions and equipment for machining long workpieces.
It is the definitive bar workmachine, eliminating all compromise.

PUMA 3100UL.

Model	A (Max. turning length)	B (Max. turning diameter)	C (Door open space)
PUMA 2100 / S	520 (20.5)	480 (18.9)	695 (27.4)
PUMA 2100M / MS / Y / SY		406 (16.0)	
PUMA 2100L / LS	760 (29.9)	480 (18.9)	815 (32.1)
PUMA 2100LM / LMS / LY / LSY		406 (16.0)	
PUMA 2600 / S	760 (29.9)	480 (18.9)	815 (32.1)
PUMA 2600M / MS / Y / SY		376 (14.8)	
PUMA 2600L / LS	1280 (50.4)	480 (18.9)	1375 (54.1)
PUMA 2600LM / LMS / LY / LSY		376 (14.8)	
PUMA 2600/500	520 (20.5)	480 (18.9)	695 (27.4)
PUMA 2600M/500		376 (14.8)	
PUMA 2600B/LB	725 / 1245 (28.5 / 49.0)	480 (18.9)	815 (32.1)
PUMA 2600MB/LMB		376 (14.8)	
PUMA 2600SB/MSB	725 (28.5)	480 / 376 (18.9 / 14.8)	815 (32.1)
PUMA 2600YB/SYB		376 (14.8)	
PUMA 3100	760 (29.9)	525 (20.7)	850 (33.5)
PUMA 3100M / Y		420 (16.5)	
PUMA 3100L	1280 (50.4)	525 (20.7)	1440 (56.7)
PUMA 3100LM / LY		420 (16.5)	
PUMA 3100XL	2125 (83.7)	525 (20.7)	2260 (89.0)
PUMA 3100XLM / XLY		420 (16.5)	
PUMA 3100UL	3125 (123.0)	525 (20.7)	3260 (128.3)
PUMA 3100ULM / ULY		420 (16.5)	

Unit : mm (inch)

Main spindle

To achieve a high level of stability during machining, improvements in rigidity have been the main focus in the design process. The mounting areas of main and Sub-spindles have been significantly widened and the spindle length shortened to minimise vibration. Spindle bearing diameter has been increased to improve rigidity. This also allows a larger through bore size for the sub-spindle. Spindles are available as belt type or built-in motor type.

bar work capacity

PUMA 2100	Ø65 mm (ø2.6 inch)
PUMA 2600	Ø76 mm (ø3.0 inch)
PUMA 2600B PUMA 3100	Ø102 mm (ø4.0 inch)

Power & torque of spindle

Model	Speed (r/min)	Power [kW (Hp)]	Max. Torque [N·m (ft-lbs)]
PUMA 2100	4500	std. 18.5 (24.8)	183 (135.1)
	5000 [Built-in]	opt. 22 (29.5)	358 (264.2)
PUMA 2600	3500	std. 22 (29.5)	240 (177.1)
	4000 [Built-in]	opt. 22 (29.5)	599 (442.1)
PUMA 2600B	2800	std. 22 (29.5)	1123 (828.8)
PUMA 3100	2800	std. 22 (29.5)	1123 (828.8)
	3000 [Built-in]	opt. 30 (40.2)	1203 (887.8)

PUMA 2100 / 2600 / 3100 std.
2-axis / M / B / S/ MS spindle type

Built-in Motor Spindle Type
(opt. Y / SY models)

Sub-spindle S MS SY

To make rotary tooling more effective, precise circular positioning of the spindle is necessary. The sub-spindle has 0.001° full C-axis contour function which is same with the function of main spindle. Moreover, power and torque are increased for more cutting capability.

Power & torque of spindle

Model	Speed (r/min)	Power [kW (Hp)]	Max. Torque [N·m (ft-lbs)]
PUMA 2100 PUMA 2600	4500	std. 7.5 (10.1)	85 (61.3)
	6000 [Built-in]	opt. 15 (20.1)	134 (98.9)

Enhanced sub-spindle

Model	Previous Model	PUMA 2100 / 2600
Chuck size	135 / 170 mm (5 / 6 inch) ►	175 mm (6 inch)
Spindle bearing diameter	75 / 90 mm (3.0 / 3.5 inch) ►	90 mm (3.5 inch)
Bar capacity	43 / 53 mm (1.7 / 2.1 inch) ►	48 mm (1.9 inch)

Tailstock configuration 2A M Y

3 types of tail stocks such as manual, programmable and servo driven can be offered to customers as alternative choices.

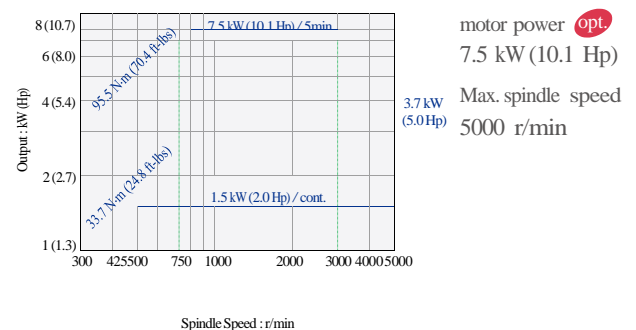| Model			PUMA 2100 / L series	PUMA 2600 / L series PUMA 3100 / L series	PUMA 3100XL / UL series
Manual type		Live center MT4	std.	Not avaliable	Not avaliable
		Built-in center MT3	opt.		
		Live center MT5	Not avaliable	std.	
		Built-in center MT4		opt.	
Programmable type		Live center MT4	opt.	Not avaliable	
		Built-in center MT3			
		Live center MT5	Not avaliable	opt.	
		Built-in center MT4			
		Built-in center MT5			std.
Servo d		Live center MT4	opt.	Not avaliable	Not avaliable
		Built-in center MT3			
		Live center MT5	Not avaliable	opt.	
		Built-in center MT4			

Turret Turn 2A S Turn-milling M MS Y SY

The turret has been designed based on a modular concept. It provides improved tool clearance and optimum rigidity. The milling turret version includes 24 position indexing to increase the available tool capacity.

		Turning PUMA 2100 / 2600 / 3100	Turn-Milling PUMA 2100 / 2600 / 3100
No. of tool stations		12 / 12 / 10 st	12 st {24*st opt., 16**st opt.}
Tooling system		Doosan Base	BMT55P / 65P / 65P
Tool size	OD	25 x 25 mm (1.0 x 1.0 inch)	
	ID	ø50 mm (ø2.0 inch)	ø40 / 50 / 50 mm (ø1.5 / 2.0 / 2.0 inch)
Curvic coupling		ø230 mm (9.1 inch)	
Turret index time		0.15 s	

* : PUMA 2100 / 2600 only ** PUMA 2100 / 2600 with Y axis only

Rotary tool power torque diagram

motor power std.
5.5 kW (7.4 Hp)
Max. spindle speed
5000 r/min

motor power opt.
7.5 kW (10.1 Hp)
Max. spindle speed
5000 r/min
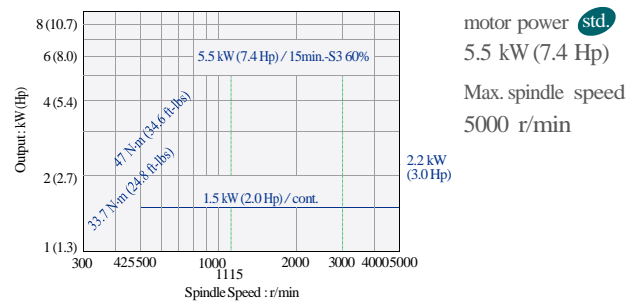
Virtual Y-axis function (Y) (SY)

In the Y-axis plane, tools can move in a plus or minus direction perpendicular to the Z-axis and spindle center line. Viewed from the operator's perspective, this Y-axis motion is toward or away from the door of the machine while X-axis moves from floor to ceiling. Y-axis enables various shape of cutting. Y-axis is realized virtually by the linear interpolation and synchronous movement of X1 and X2-axis that make it possible to lower machine height for stability.

Y-axis travel

PUMA 2100 / 2600

105 mm
[±52.5mm] (4.1 inch [±2.1 inch])

PUMA 3100

130 mm
[±65.0mm] (5.1 inch [±2.6 inch])

Y-axis rapid

10 m/min (7.4 ipm)

Configuration of Y-axis

Model	PUMA 2100/2600	PUMA 3100
Bed slant angle	30°	30°
X slant angle	30°	30°
X-Y slant angle	30°	30°
Y-axis travel	±52.5 mm (±2.1 inch)	±65.0 mm (±2.6 inch)
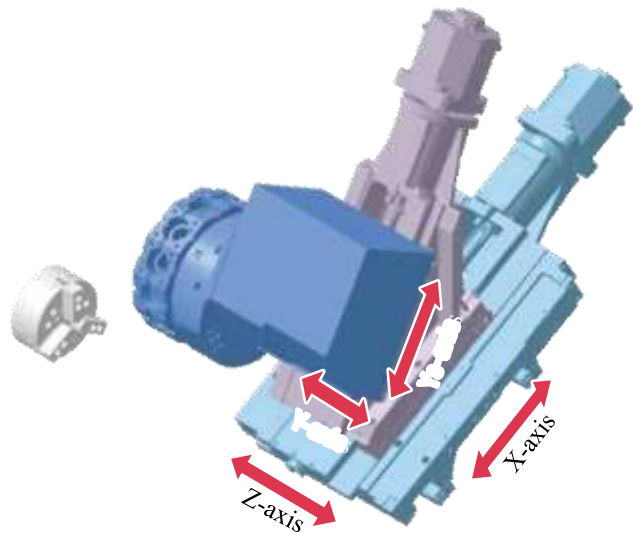
All enough in single setup

Simultaneous XYZ motion provides the capability milling complex shapes. In addition, the rigidly clamped C-axis disc brake enables heavy duty and precision machining.
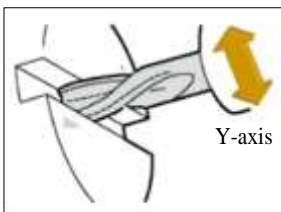
On-center face groove
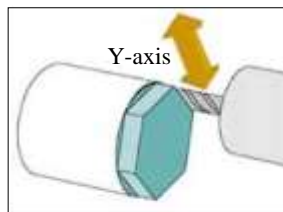
Poly-side machine

Off-center side groove
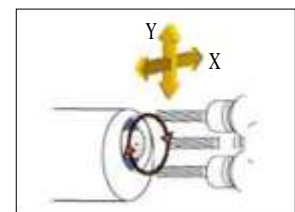
Y&X-axis circular interpolation

Improved Maintainability

Maintainability is one of the crucial criteria that Doosan placed at the forefront of machine development. Large openings in the machine paneling facilitate access to the underlying maintenance units like lubricant oil tank and pneumatic fittings.

PUMA 2100/2600/3100 series

Easy to Access for Maintenance

By new machine cover design concept, maintenance locations are easily seen, and wider openings allow easier access.

The coolant tank can be pulled out at the front and does not require the chip conveyor to be removed.
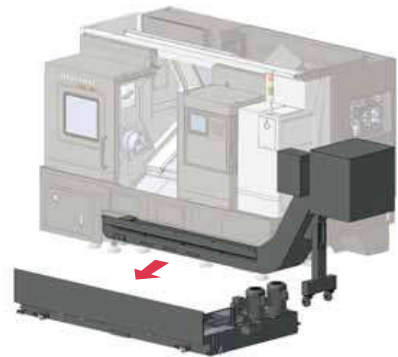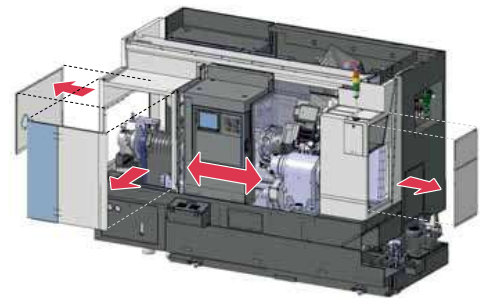
Fully Wrapped Machine

To minimize the thermal effect on the machine, heat of chips should be prevented from being transmitted to bed and guide ways. Guide ways are fully covered so that heat can be isolated. Also, telescopic covers have strengthened linkage system that ensures durability. (only PUMA 2100/2600)
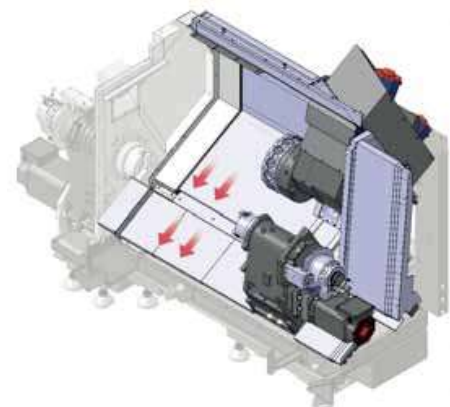
Power Saving Function

Automatic machine light turns off

This is smart function that can turn off the machine light automatically when no user touches key board of operation panel during specified time.

Automatic machine sleep

If CNC operator's panel has not been used for a time, the motors for spindle, servo axis, coolant pump and chip conveyor etc. are powered off automatically. It is effective to reduce standby power. Save up stand by power from 10 to 14%.

EZ Function

This function is to support simple setting of Tool Setter and improve the function to set tail stock position automatically with recorded tail stock position.

EZ automatic tail stock function

This function enables the position setting of tail stock automatically. In programmable tail stock, the Z-axis position of tail stock is recorded automatically as the clamped position of tail stock. When tail stock needs to move to the other position, Z-axis moves to the pre-recorded position of Z-axis and tail stock unclamps by the button operation of OP pane.

EZ tool setter function

This is specially designed for improving the efficiency of CNC turning center. If a user selects target tool to be checked by Tool Setter in manual mode, its moving axis is advanced forward to make the setter easy to touch off the tools, and the axis moves backward after touching the tool automatically.

Easy Operation Package

These DOOSAN software packages have been customized to provide user-friendly functions.

Programming

G Code list

Operator can check the meaning of each G-code.

M Code list

Operator can check the meaning of each M-code.

Calculator

Operator can calcute numerical formula in relation to arc and hole easily.

Servo tailstock thrust setting

Thrust force control is simple to set up using the specially designed servo-driven tail stock thrust setting software.
- Input value directly
- Select one of the initially set values

Operation / Maintenance

Tool load monitor `opt.`

The main function of this software is to detect overload when a tool is wrong, and change it to an other tool. Stop machine to protect a tool holder and next tools by detecting overload caused by tool breakage or its wear. Use editable tool life management for spare tools. Monitor load meter for all spindles and axes. If the tool load reaches abnormal band recorded in "Set data", the software issues an feed hold alarm or skips the tool.

Operation rate - user log in

A major determinant of efficiency is the cost associated with setting up the equipment to make a particular product. This software can be used to manage machine operation rate of 3 operators. Total machine operation and real machining time for a month can be recorded and measured. It helps to evaluate and monitor each operational efficiency. To keep it secure, Password setting is essential.

Back up custom data

This can be used to record tool load information detected in "Tool load monitor" for all tools used during cutting. By reloading recorded data in tool table, Tool Load Monitor software can compare the actual tool load with a recorded load pattern.

Turret recovery help

The software is to help users recover turret step by step from trouble situation where it does not work. It can quickly recover your valuable machine.

Easy Guide i

Operation Guidance, which supports entire operations on an all-in-one screen for daily machining including creating a program on the machine.

- Uses one display screen to perform all operations including programming, checking by animation, and real machining.
- User-Friendly Operation :
  Soft key selection of comprehensive cycle library
- Easy programming
  Based on ISO-code program format, complex machining motions can be created easily by this menu format.
- Machine status window
  Machine status such as actual position, feedrate and load meter are always displayed.
- Realistic machining simulation
  3-D solid model machining simulation is available.
- Intuitive menu selecting
  Menu can be selected easily and intuitively by soft-keys with icons.

Cycle machining menus for both of lathe machining and milling are available

Programming time can be reduced

Spindle Power - Torque Diagram

Main spindle power - torque diagram PUMA 2100 series
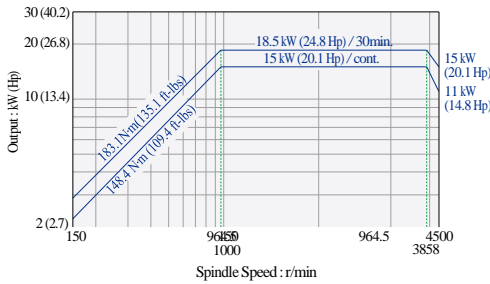
Belt Type std. | Spindle motor power 18.5 kW (24.8 Hp) | Max. spindle speed 4500 r/min
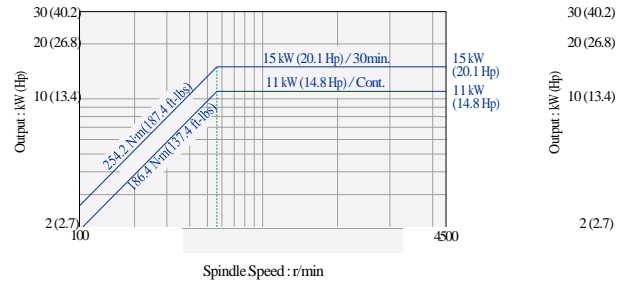
Belt Type opt. I | Spindle motor power 15 kW (20.1 Hp) | Max. spindle speed 4500 r/min
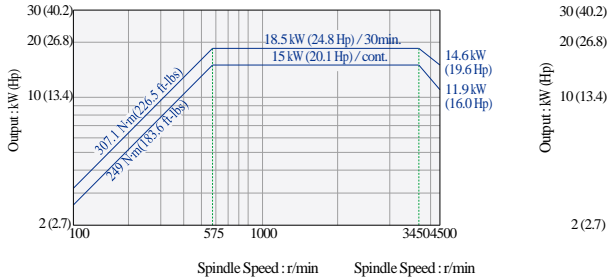
Belt Type opt. II | Spindle motor power 18.5 kW (24.8 Hp) | Max. spindle speed 4500 r/min
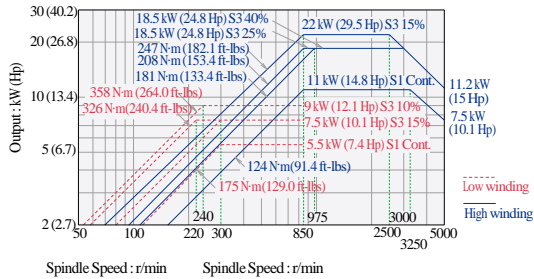
Built-in Type opt. I
* Only for Y-axis model | Spindle motor power 22 kW (29.5 Hp) | Max. spindle speed 5000 r/min

Main spindle power - torque diagram PUMA 2600 series
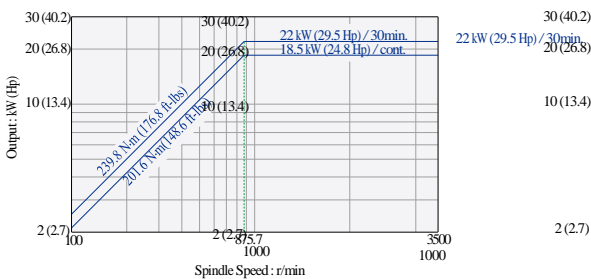
Belt Type std. | Spindle motor power 22 kW (29.5 Hp) | Max. spindle speed 3500 r/min

Belt Type opt. I | Spindle motor power 18.5 kW (24.8 Hp) | Max. spindle speed 3500 r/min
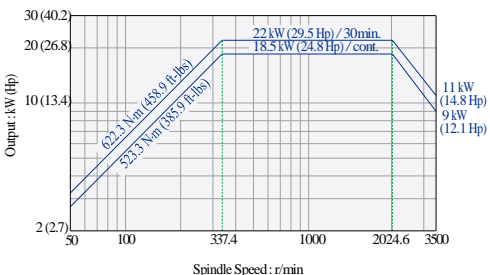
Belt Type opt. II | Spindle motor power 22 kW (29.5 Hp) | Max. spindle speed 3500 r/min

Built-in Type opt. I
* Only for Y-axis model | Spindle motor power 22 kW (29.5 Hp) | Max. spindle speed 4000 r/min

Spindle Power - Torque Diagram

Main spindle power - torque diagram PUMA 2600 / 500, PUMA 2600M / 500

Diagram labels:
- 18.5 kW (24.8 Hp) / 30min. S3 60%
- 5 kW (20.1 Hp) / Con.
- 15 kW (20.1 Hp)
- 11 kW (14.8 Hp)
- 235.4 N·m (173.7 ft-lbs)
- 190.9 N·m (140.9 ft-lbs)
- Output : kW (Hp)
- 10 (13.4)
- Spindle Speed : r/min
- 100 750 1000 3000 3500 10000
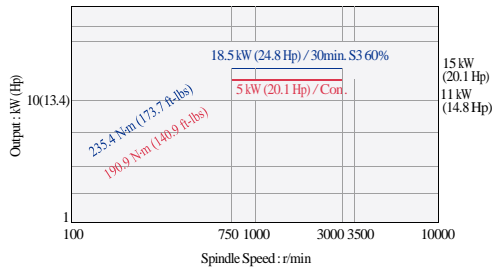
Belt Type std. | Spindle motor power 18.5 kW (Hp) | Max. spindle speed 3500 r/min

Main spindle power - torque diagram PUMA 2600B / 3100 series

Diagram labels:
- 22 kW 15min.S3 15% (29.5 Hp)
- 22 kW 30min.S3 60% (29.5 Hp)
- 1123 N·m (828.2 ft-lbs)
- 18.5 kW Cont. (24.8 Hp)
- 781 N·m (576.0 ft-lbs)
- 13 kW Cont. (17.4 Hp)
- 656 N·m (483.8 ft-lbs)
- 664 N·m (489.7 ft-lbs)
- 11 kW (14.8 Hp)
- 9 kW (12.1 Hp)
- Low winding
- High winding
- Output : kW (Hp)
- 50 (67.1) 40 (53.6) 30 (40.2) 20 (26.8) 10 (13.4) 2 (2.7)
- 30 100 187 269 467 700 500 1000 1612 2800 3000
- Spindle Speed : r/min

Belt Type std. | Spindle motor power 22 kW (29.5 Hp) | Max. spindle speed 2800 r/min

Diagram labels:
- 1198 N·m (884.1 ft-lbs)
- 26 kW (34.9Hp) 30min. S3 60%
- 22 kW (29.5 Hp) Cont.
- 1014 N·m (748.3 ft-lbs)
- 300 N·m (221.4 ft-lbs)
- 253 N·m (186.7 ft-lbs)
- Output : kW (Hp)
- 40 (53.6) 30 (40.2) 20 (26.8) 10 (13.4) 2 (2.7)
- 50 100 207 829 1000 2800 3000
- Spindle Speed : r/min

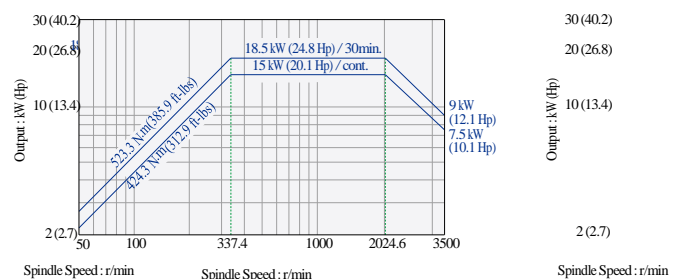**Belt Type with Gear Box** opt. | Spindle motor power 26 kW (34.9 Hp) | Max. spindle speed 2800 r/min

※ PUMA 2600B/LB, PUMA 3100/L/XL/UL only

Main spindle power - torque diagram PUMA 3100 series

Diagram labels:
- 30 kW (40.2 Hp) S2 30min.
- 25 kW (33.5 Hp) Cont.
- 1203 N·m (887.2 ft-lbs)
- 1003 N·m (739.7 ft-lbs)
- 20.5 kW (27.5 Hp)
- 16.8 kW (22.5 Hp)
- 572 N·m (421.8 ft-lbs)
- 477 N·m (351.8 ft-lbs)
- Low winding
- High winding
- Output : kW (Hp)
- 50 (67.1) 30 (40.2) 20 (26.8) 10 (13.4) 2 (2.7)
- 30 100 238 500 1000 1600 3000
- Spindle Speed : r/min
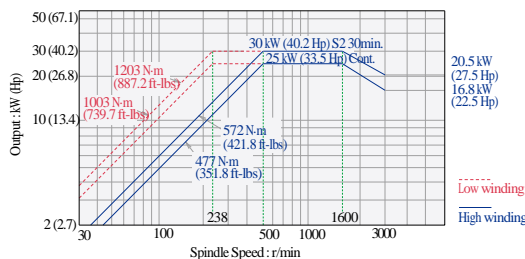
Built-in Type opt. I | Spindle motor power 30 kW (40.2 Hp) | Max. spindle speed 3000 r/min

Sub spindle power - torque diagram PUMA 2100 / 2600

Diagram labels:
- 7.5 kW (10.1 Hp) / 30min.
- 5.5 kW (7.4 Hp) / cont.
- 84.8 N·m (62.5 ft-lbs)
- 62.2 N·m (45.8 ft-lbs)
- Output : kW (Hp)
- 10 (13.4) 8 (10.7) 6 (8.0) 4 (5.4) 2 (2.7)
- 300 500 843.7 1000 2000 3000 4500
- Spindle Speed : r/min
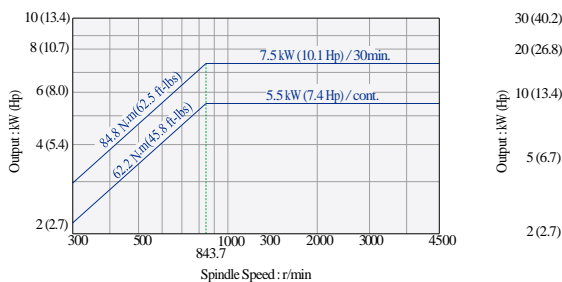
Belt Type std. | Spindle motor power 7.5 kW (10.1 Hp) | Max. spindle speed 4500 r/min

Diagram labels:
- 15 kW / 30min. (20.1 Hp)
- 11 kW / Cont. (14.8 Hp)
- 134 N·m (98.8 ft-lbs)
- 98 N·m (72.2 ft-lbs)
- 57 N·m (42.0 ft-lbs)
- 42 N·m (30.9 ft-lbs)
- Low winding
- High winding
- Output : kW (Hp)
- 30 (40.2) 20 (26.8) 10 (13.4) 5 (6.7) 2 (2.7)
- 200 500 1000 1060 1600 2500 4000 6000
- Spindle Speed : r/min
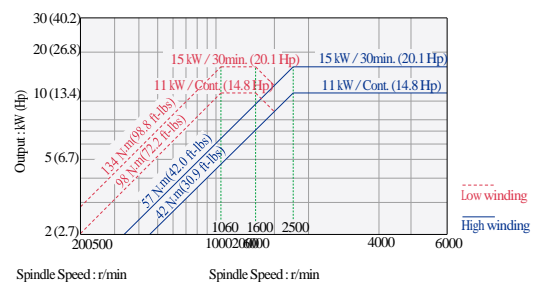
Built-in Type opt | Spindle motor power 15 kW (20.1 Hp) | Max. spindle speed 6000 r/min

External Dimensions

PUMA 2100

Unit : mm (inch)

Front view
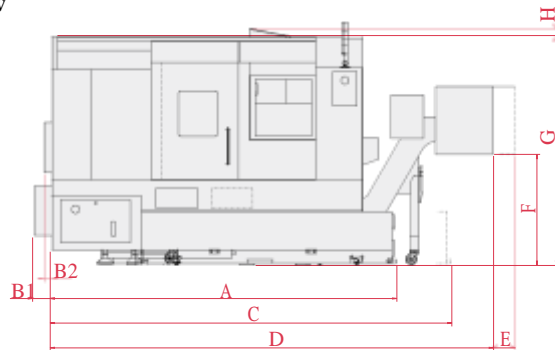
Side view
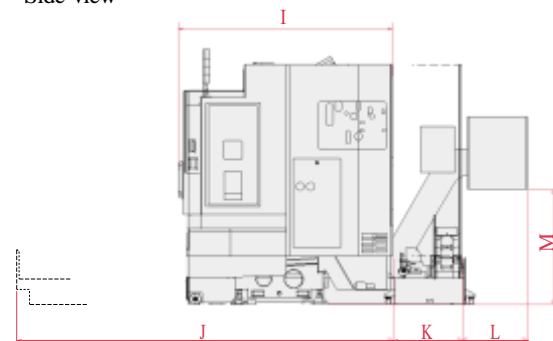
Model	A	B1	B2	C	D	E	F	G	H	I	J	K	L	M
PUMA 2100/S/M/MS	3150 (124.0)	160 (6.3)	-	3650 (143.7)	4030 (158.7)	200 (7.9)	1010 (39.8)	1903 (74.9)	-	1863 (73.3)	3240 (127.6)	523 (20.6)	646 (25.4)	1007 (39.6)
PUMA 2100Y/SY	3150 (124.0)	160 (6.3)	25 (1.0)	3650 (143.7)	4030 (158.7)	200 (7.9)	1010 (39.8)	2090 (82.3)	73 (2.9)	1863 (73.3)	3240 (127.6)	523 (20.6)	646 (25.4)	1007 (39.6)
PUMA 2100L/LS/LM/LMS	3370 (132.7)	160 (6.3)		3870 (152.4)	4250 (167.3)	200 (7.9)	1010 (39.8)	1903 (74.9)	-	1863 (73.3)	3240 (127.6)	523 (20.6)	646 (25.4)	1007 (39.6)
PUMA 2100LY/LSY	3370 (132.7)	160 (6.3)	25 (1.0)	3870 (152.4)	4250 (167.3)	200 (7.9)	1010 (39.8)	2090 (82.3)	73 (2.9)	1863 (73.3)	3240 (127.6)	523 (20.6)	646 (25.4)	1007 (39.6)

B1 : Belt type. Standard Spindle Motor, Optional Spindle Motor is different.
B2 : Built-In type.

PUMA 2600

Unit : mm (inch)

Front view

Side view
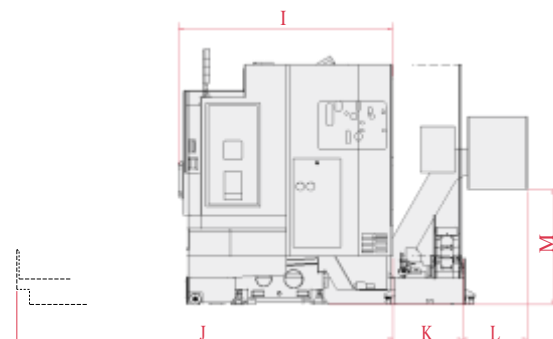
Model	A	B1	B2	C	D	E	F	G	H	I	J	K	L	M
PUMA 2600/500 PUMA 2600M/500	3150 (124.0)	220 (8.7)	-	3650 (143.7)	4030 (158.7)	200 (7.9)	1010 (39.8)	1903 (74.9)	-	1863 (73.3)	3240 (127.6)	523 (20.6)	646 (25.4)	1007 (39.6)
PUMA 2600/S/M/MS	3370 (132.7)	230 (9.1)	-	3870 (152.4)	4250 (167.3)	200 (7.9)	1010 (39.8)	1903 (74.9)	-	1863 (73.3)	3240 (127.6)	523 (20.6)	646 (25.4)	1007 (39.6)
PUMA 2600B/SB/MB/MSB	3370 (132.7)	333 (13.1)	-	3870 (152.4)	4250 (167.3)	200 (7.9)	1010 (39.8)	1903 (74.9)	-	1863 (73.3)	3240 (127.6)	523 (20.6)	646 (25.4)	1007 (39.6)
PUMA 2600Y/SY	3370 (132.7)	230 (9.1)	135 (5.3)	3870 (152.4)	4250 (167.3)	200 (7.9)	1010 (39.8)	2090 (82.3)	73 (2.9)	1863 (73.3)	3240 (127.6)	523 (20.6)	646 (25.4)	1007 (39.6)
PUMA 2600YB/SYB	3370 (132.7)	333 (13.1)	-	3870 (152.4)	4250 (167.3)	200 (7.9)	1010 (39.8)	2090 (82.3)	73 (2.9)	1863 (73.3)	3240 (127.6)	523 (20.6)	646 (25.4)	1007 (39.6)

B1 : Belt type. Standard Spindle Motor, Optional Spindle Motor is different.
B2 : Built-In type.

External Dimensions

PUMA 2600L

Front view
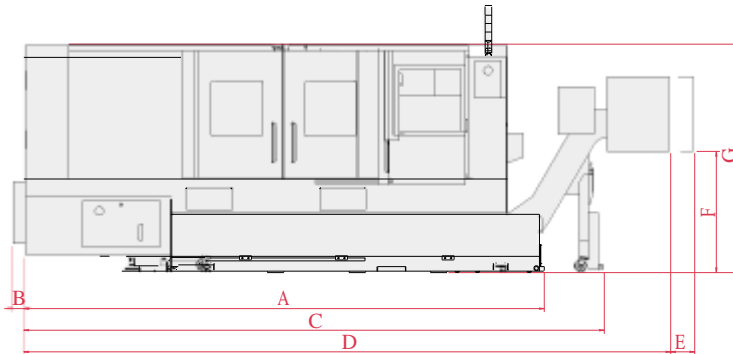
Side view
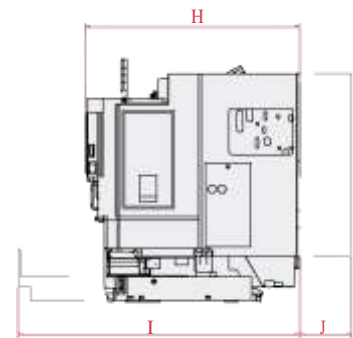
Model	A	B	C	D	E	F	G	H	I	J
PUMA 2600L/LS/LM/LMS	4335 (170.7)	-	4835 (190.4)	5389 (212.2)	200 (7.9)	1010 (39.8)	1903 (74.9)	1965 (77.4)	3240 (127.6)	523 (20.6)
PUMA 2600LB/LSB/LMSB	4335 (170.7)	103 (4.1)	4835 (190.4)	5389 (212.2)	200 (7.9)	1010 (39.8)	1903 (74.9)	1965 (77.4)	3240 (127.6)	523 (20.6)

PUMA 2600LY

Unit : mm (inch)

Front view
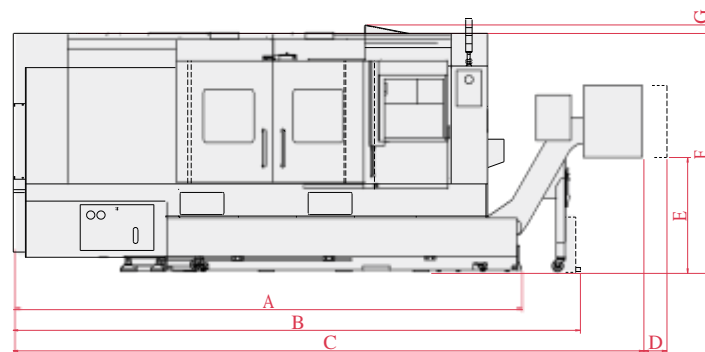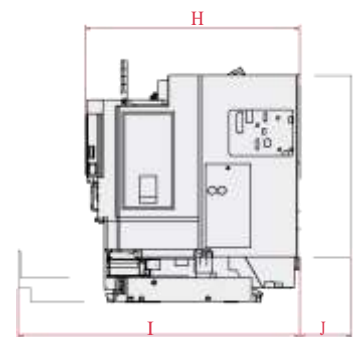
Side view

Model	A	B	C	D	E	F	G	H	I	J
PUMA 2600LY/LSY/LYB/LSYB	4435 (174.6)	4935 (194.3)	5489 (216.1)	200 (7.9)	1010 (39.8)	2090 (82.3)	73 (2.9)	1965 (77.4)	3240 (127.6)	523 (20.6)

External Dimensions

PUMA 3100

Front view   Side view

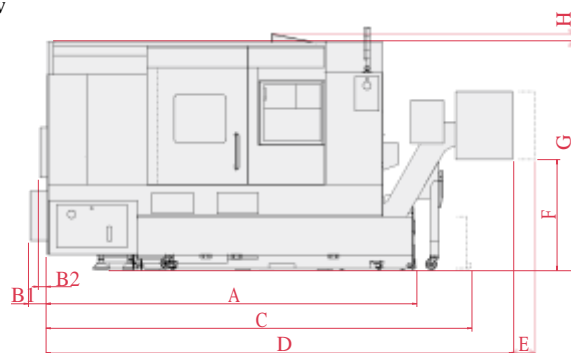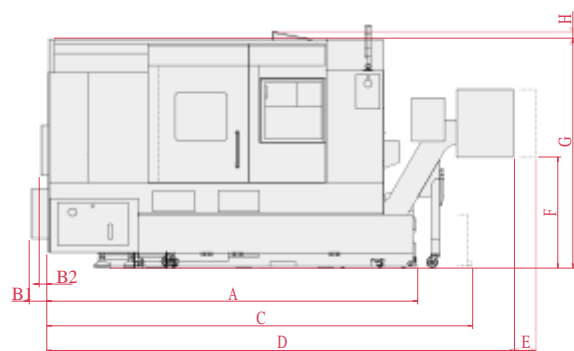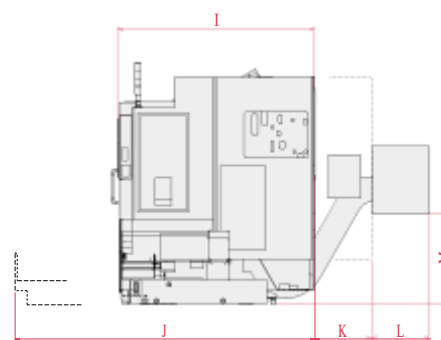| Model	A	B1	B2	C	D	E	F	G	H	I	J	K	L	M
PUMA 3100/M	3575 (140.7)	332 (13.1)	250 (9.8)	4095 (161.2)	4486 (176.6)	200 (7.9)	1010 (39.8)	1997 (78.6)	20 (0.8)	2003 (78.9)	3410 (134.3)	523 (20.6)	646 (25.4)	1007 (39.6)
PUMA 3100Y	3575 (140.7)	332 (13.1)	250 (9.8)	4095 (161.2)	4486 (176.6)	200 (7.9)	1010 (39.8)	2214 (87.2)	105 (4.1)	2003 (78.9)	3410 (134.3)	523 (20.6)	646 (25.4)	1007 (39.6)

B1 : Belt type. Standard Spindle Motor, Optional Spindle Motor is different.
B2 : Built-In type.

PUMA 3100L
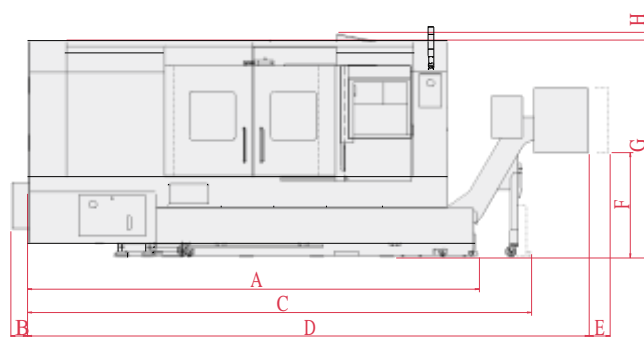
Front view   Side view
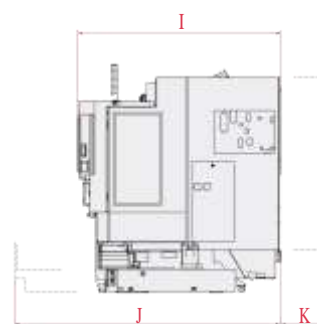
Model	A	B	C	D	E	F	G	H	I	J	K
PUMA 3100L/LM	4455 (175.4)	72 (2.8)	5135 (202.2)	5527 (217.6)	50 (2.0)	1010 (39.8)	1997 (78.6)	20 (0.8)	2105 (82.9)	3410 (134.3)	523 (20.6)

External Dimensions

PUMA 3100LY
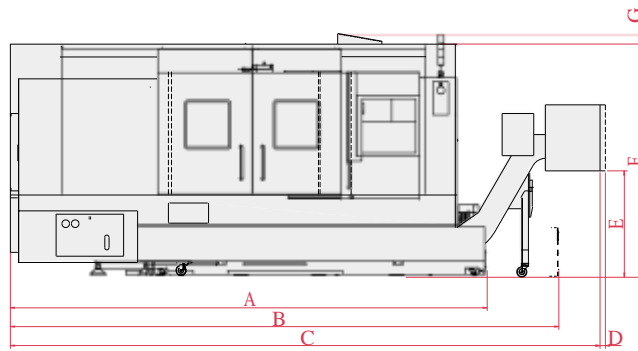
Front view
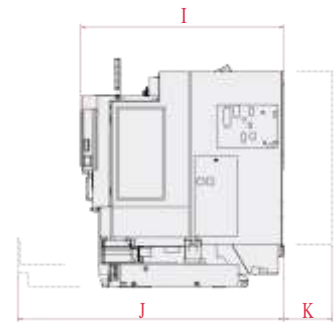
Side view

Model	A	B	C	D	E	F	G	I	J	K
PUMA 3100LY	4530 (178.4)	5210 (205.2)	5602 (220.6)	50 (2.0)	1010 (39.8)	2214 (87.2)	105 (4.1)	2105 (82.9)	3410 (134.3)	523 (20.6)

PUMA 3100XL／UL

Front view
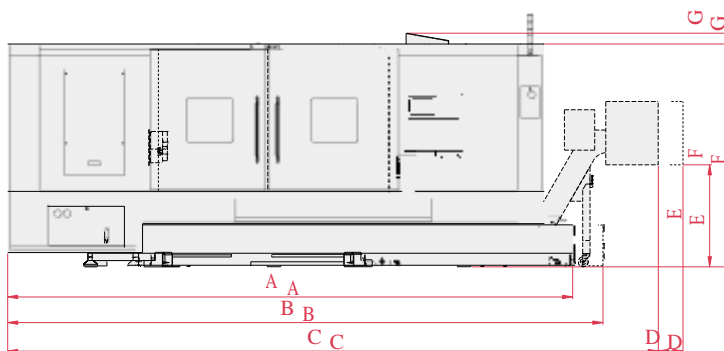
Side view
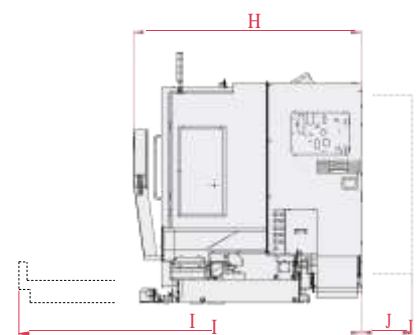
Model	A	B	C	D	E	F	G	H	I	J
PUMA 3100XL/XLM	5615 (221.1)	6015 (236.8)	6443 (253.7)	245 (9.6)	1010 (39.8)	2208 (86.9)	-	2280 (89.8)	3400 (133.9)	523 (20.6)
PUMA 3100XLY	5615 (221.1)	6015 (236.8)	6443 (253.7)	245 (9.6)	1010 (39.8)	2208 (86.9)	107 (4.2)	2280 (89.8)	3400 (133.9)	523 (20.6)
PUMA 3100UL/ULM	6585 (259.3)	7265 (286.0)	7670 (302.0)	268 (10.6)	1010 (39.8)	2208 (86.9)	-	2280 (89.8)	3400 (133.9)	523 (20.6)
PUMA 3100ULY	6585 (259.3)	7265 (286.0)	7670 (302.0)	268 (10.6)	1010 (39.8)	2208 (86.9)	107 (4.2)	2280 (89.8)	3400 (133.9)	523 (20.6)

Standard & Optional Features

●: standard features　○: option　△: Pre-discussion is required　X: Not available

Option	PUMA 2100(L) / 2600(L)						PUMA 3100 Std./L			PUMA 3100 XL/UL		
	2-axis Std.	M	S	MS	Y	SY	2-axis Std.	M	Y	2-axis Std.	M	Y
Special chucks	△	△	△	△	△	△	△	△	△	△	△	△
Soft jaws	●	●	●	●	●	●	●	●	●	●	●	●
Dual pressure chucking	○	○	○	○	○	○	○	○	○	○	○	
Hydraulic chuck pressure switch	○	○	○	○	○	○	○	○	○	○	○	○
Chuck clamp confirmation	○	○	○	○	○	○	○	○	○	○	○	
Tail stock center : Live center	●	●	X	X	●	X	●	●	●	X	X	X
Tail stock center : Dead center	○	○	X	X	○	X	○	○	○	●	●	●
Tail stock : Manual	●	●	X	X	●	X	●	●	●	X	X	X
Tail stock : Programmable	○	○	X	X	○	X	○	○	○	●	●	●
Tail stock : Servo driven	○	○	X	X	○	X	○	○	○	X	X	X
Automatic quill advance & retract	○	○	X	X	○	X	○	○	○	○	○	○
Rotary tool holder	X	●	X	●	●	●	X	●	●	X	●	●
Tool setter : Manual	○	○	○	○	○	○	○	○	○	○	○	○
Tool setter : Automatic_electric	○	○	○	○	○	○	○	○	○	○	○	○
Auto workpiece measurement	○	○	○	○	○	○	○	○	○	○	○	○
Linear scale (X-axis)	○	○	○	○	○	○	○	○	○	○	○	○
Linear scale (Z-axis)	○	○	○	○	○	○	○	○	○	○	○	○
Linear scale (Y-axis)	X	X	X	X	○	○	X	X	○	X	X	○
Feedback system : Absolute position encoder	●	●	●	●	●	●	●	●	●	●	●	●
Bar feeder interface	○	○	○	○	○	○	○	○	○	○	○	○
Bar puller	△	△	△	△	△	△	△	△	△	X	X	X
Workpiece ejector	X	X	○	○	X	○	X	X	X	X	X	X
Parts catcher with box	○	○	○	○	○	○	△	△	△	X	X	X
Parts catcher with conveyor	○	○	○	○	○	○	△	△	△	X	X	X
Workpiece cut off confirmation	X	X	○	○	X	○	X	X	X	X	X	X
Automatic front door : with safety device	○	○	○	○	○	○	○	○	○	○	○	○
Chip conveyor type : Right side	○	○	○	○	○	○	○	○	○	○	○	○
Chip conveyor type : Rear side *1	○	○	○	○	○	○	○	○	○	X	X	X
Chip bucket	○	○	○	○	○	○	○	○	○	○	○	○
TSC for main / left spindle	○	○	○	○	○	○	○	○	○	○	○	○
Oil skimmer	○	○	○	○	○	○	○	○	○	○	○	○
Coolant level switch	○	○	○	○	○	○	○	○	○	○	○	○
Coolant chiller	○	○	○	○	○	○	○	○	○	○	○	○
Oil mist collector	○	○	○	○	○	○	○	○	○	○	○	○
Coolant blower	○	○	○	○	○	○	○	○	○	○	○	○
Air blower	○	○	○	○	○	○	○	○	○	○	○	○
Air gun	○	○	○	○	○	○	○	○	○	○	○	○
Signal tower (yellow, red, green)	○	○	○	○	○	○	○	○	○	○	○	○
Gantry loader	△	△	△	△	△	△	△	△	△	△	△	△
V-stand for shaft workpiece	○	○	X	X	○	X	○	○	○	X	X	X

*1 : PUMA 2100/L, PUMA 2600, PUMA 3100 only

PUMA 3100XL ／ UL

○ : option　X : Not available

Steady Rest		PUMA 2100		PUMA 2600		PUMA 3100	
		Std.	L	Std.	L	Std./L	XL/UL
Type	Hydraulic	○	○	○	○	○	○
	Programmable	○	○	○	○	○	○
	Servo driven*1	X	X	X	X	X	○
Size	SLU-1	○	○	○	○	X	X
	SLU-2	○	○	○	○	○	○
	SLU-B3.1	X	○	○	○	X	X
	SLU-3.1	X	X	X	X	○	○
	SLU-3.2	X	X	X	X	X	○
	SLU-4	X	X	X	X	X	○*2
	SLU-B4	X	X	X	X	X	○

*1 : Rack & Pinion type.　*2 : SLU-4 is not available in servo driven type.

High pressure coolant

Model		PUMA 2100 / 2600 / 3100	
		60Hz	50Hz
Standard	1.5 bar	0.4 kW x 0.15 MPa x 40 L/min (0.5 Hp x 21.8 psi x 10.6 galon/min)	0.4 kW x 0.15 MPa x 40 L/min (0.5 Hp x 21.8 psi x 10.6 galon/min)
option	5 bar	0.9 kW x 0.45 MPa x 30 L/min (1.2 Hp x 65.3 psi x 7.9 galon/min)	0.9 kW x 0.30 MPa x 30 L/min (1.2 Hp x 43.5 psi x 7.9 galon/min)
	7 bar	1.5 kW x 0.7 MPa x 30 L/min (2.0 Hp x 101.5 psi x 7.9 galon/min)	1.5 kW x 0.5 MPa x 30 L/min (2.0 Hp x 72.5 psi x 7.9 galon/min)
	10 bar*	2.2 kW x 1.0 MPa x 30 L/min (3.0 Hp x 145.0 psi x 7.9 galon/min)	2.2 kW x 0.7 MPa x 30 L/min (3.0 Hp x 101.5 psi x 7.9 galon/min)
	15 bar*	3.7 kW x 1.45 MPa x 30 L/min (5.0 Hp x 210.3 psi x 7.9 galon/min)	4.0 kW x 2.8 MPa x 20 L/min (5.0 Hp x 145.0 psi x 7.9 galon/min)
Special option	28 bar*	4.0 kW x 2.8 MPa x 20 L/min (5.4 Hp x 406.6 psi x 5.3 galon/min)	4.0 kW x 1.95 MPa x 20 L/min (5.0 Hp x 282.8 psi x 5.3 galon/min)
	70 bar*	5.5 kW x 7.0 MPa x 30 L/min (7.4 Hp x 1015.0 psi x 7.9 galon/min)	5.5 kW x 7.0 MPa x 26 L/min (7.4 Hp x 1015.0 psi x 6.9 galon/min)

* Recommend using coolant chiller

Machine Specifications PUMA 2100 series

Description		Unit	PUMA 2100/L	PUMA 2100M/LM	PUMA 2100MS/LMS	PUMA 2100S/LS
Capacity	Swing over bed	mm (inch)	780 (30.7)			
	Swing over front door	mm (inch)	680 (26.8)			
	Swing over saddle	mm (inch)	630 (24.8)			
	Recom. Turning diameter	mm (inch)	210 (8.3)			
	Max. turning diameter	mm (inch)	480 (18.9)	406 (16.0)		480 (18.9)
	Max. turning length	mm (inch)	520 / 760 (20.5 / 29.9)			
	Bar working diameter	mm (inch)	65 (2.6)			
Travels	Travel distance X-axis	mm (inch)	260 [20+240] (10.2 [0.8+9.4])	260 [57+203] (10.2 [2.2+8.0])		260 [20+240] (10.2 [0.8+9.4])
	Z-axis	mm (inch)	590 / 830 (23.2 / 32.7)			
	Y-axis	mm (inch)	-			
	B-axis	mm (inch)	-		590 / 830 (23.2 / 32.7)	
Feedrates	Rapid traverse X-axis	m/min (ipm)	30 (1181.1)			
	Z-axis	m/min (ipm)	30 (1181.1)			
	Y-axis	m/min (ipm)	-			
	B-axis	m/min (ipm)	-		30 (1181.1)	
Main Spindle	Spindle speed (Belt Type)	r/min	4500			
	Spindle speed (Built-in Type)	r/min	-			
	Spindle nose		ASA A2#6			
	Spindle bearing diameter (Front)	mm (inch)	120 (4.7)			
	Spindle through hole diameter	mm (inch)	76 (3.0)			
	Min. spindle indexing angle (C-axis)	deg	-	0.001		
Turret	No. of tool stations	st	12	12 [24]		12
	OD tool size	mm (inch)	25 (1.0)	25 [20] (1.0 [0.8])		25 (1.0)
	Boring bar diameter	mm (inch)	50 (2.0)	40 [32] (1.6 [1.3])		50 (2.0)
	Indexing time (1st swivel time)	s	0.15			
	Rotary tool spindle speed	r/min	-	5000		-
Tail stock	Quill diameter	mm (inch)	80 (3.1)		-	
	Quill bore taper (Live)		MT#4		-	
	Compressed air supply	mm (inch)	80 (3.1)		-	
Sub-spindle	Spindle speed (Belt [Built-in])	r/min	-		4500 [-]	
	Spindle nose		-		ASA A2-5	
	Spindle bearing diameter (Front)	mm (inch)	-		90 (3.5)	
	Spindle through hole diameter	mm (inch)	-		62 (2.4)	
	Min. spindle indexing angle (C-axis)	deg	-		0.001	
Motors	Main spindle motor	kW (Hp)	18.5 / 15 (24.8 / 20.1)			
	Sub spindle motor	kW (Hp)	-		7.5 / 5.5 (10.1 / 7.4)	
	Rotary tool spindle motor	kW (Hp)	-	5.5 (7.4)		-
	Coolant pump motor	kW (Hp)	0.4 (0.5)			
Power source	Electric power supply (Rated capacity)	kVA	35.63	38.41	45.63	42.85
Machine size	Machine height	mm (inch)	1900 (74.8)			
	Machine dimension length	mm (inch)	3310 / 3530 (130.3 / 139.0)			
	width	mm (inch)	1863 (73.3)			
	Machine weight	kg (lb)	4850 / 5350 (10692.3 / 11794.6)	5000 / 5500 (11023.0 / 12125.2)	5450 / 5950 (12015.0 / 13117.3)	5300 / 5800 (11684.3 / 12786.6)

[ ] : Option

• The specifications and information above-mentioned may be changed without prior notice.
• For more details, please contact Doosan

Machine Specifications   PUMA 2100 /2600 series

Description			Unit	PUMA 2100Y/LY	P 2100SY/LSY	PUMA 2600/L	PUMA 2600M/LM
Capacity	Swing over bed		mm (inch)	780 (30.7)			
	Swing over front door		mm (inch)	680 (26.8)			
	Swing over saddle		mm (inch)	630 (24.8)			
	Recom. Turning diameter		mm (inch)	210 (8.3)		255 (10.0)	
	Max. turning diameter		mm (inch)	406 (16.0)		480 (18.9)	376 (14.8)
	Max. turning length		mm (inch)	520 / 760 (20.5 / 29.9)		760 / 1280 (29.9 / 50.4)	
	Bar working diameter		mm (inch)	65 (2.6)		76 (3.0)	
Travels	Travel distance	X-axis	mm (inch)	260 [57+203] (10.2 [2.2+8.0])		260 [20+240] (10.2 [0.8+9.4])	260 [72+188] (10.2 [2.8+7.4])
		Z-axis	mm (inch)	590 / 830 (23.2 / 32.7)		830 / 1350 (32.7 / 53.1)	
		Y-axis	mm (inch)	105 [±52.5] (4.13 [±2.065])		-	
		B-axis	mm (inch)	-	590 / 830 (23.2 / 32.7)	-	
Feedrates	Rapid traverse	X-axis	m/min (ipm)	30 (1181.1)			
		Z-axis	m/min (ipm)	30 (1181.1)			
		Y-axis	m/min (ipm)	10 (393.7)		-	
		B-axis	m/min (ipm)	-	30 (1181.1)	-	
Main Spindle	Spindle speed (Belt Type)		r/min	4500		3500	
	Spindle speed(Built-in Type)		r/min	5000		-	
	Spindle nose			ASA A2#6		ASA A2#8	
	Spindle bearing diameter (Front)		mm (inch)	120 (4.7)		140 (5.5)	
	Spindle through hole diameter		mm (inch)	76 (3.0)		86 (3.4)	
	Min. spindle indexing angle (C-axis)		deg	0.001		-	0.001
Turret	No. of tool stations		st	12 [24] [16]		12	12 [24]
	OD tool size		mm (inch)	25 [20][25] (1.0 [0.8] [1.0])		25 (1.0)	25 [20] (1.0 [0.8])
	Boring bar diameter		mm (inch)	40 [32] [32] (1.6 [1.3] [1.6])		50 (2.0)	50 [40] (2.0 [1.6])
	Indexing time (1st swivel time)		s	0.15			
	Rotary tool spindle speed		r/min	5000		-	5000
Tail stock	Quill diameter		mm (inch)	80 (3.1)	-	100 (3.9)	
	Quill bore taper (Live)			MT#4	-	MT#5	
	Quill travel		mm (inch)	80 (3.1)	-	100 (3.9)	
Sub-spindle	Spindle speed (Belt [Built-in])		r/min	-	4500 [6000]	-	
	Spindle nose			-	ASA A2-5	-	
	Spindle bearing diameter (Front)		mm (inch)	-	90 (3.5)	-	
	Spindle through hole diameter		mm (inch)	-	62 (2.4)	-	
	Min. spindle indexing angle (C-axis)		deg	-	0.001	-	
Motors	Main spindle motor		kW (Hp)	18.5 / 15 (24.8 / 20.1)		22 / 18.5 (29.5 / 24.8)	
	Sub spindle motor		kW (Hp)	-	7.5 / 5.5 (10.1 / 7.4)	-	
	Rotary tool spindle motor		kW (Hp)	5.5 (7.4)		-	
	Coolant pump motor		kW (Hp)	0.4 (0.5)			
Power source	Electric power supply (Rated capacity)		kVA	41.32	48.54	40.72	43.5
Machine size	Machine height		mm (inch)	2163 (85.2)		1900 (74.8)	
	Machine dimension	length	mm (inch)	3310 / 3530 (130.3 / 139.0)		3600 / 4335 (141.7 / 170.7)	
		width	mm (inch)	1863 (73.3)		1863 / 1965 (73.3 / 77.4)	
	Machine weight		kg (lb)	5450 / 5950 (12015.0 / 13117.3)	5900 / 6400 (13007.1 / 14109.4)	5400 / 6700 (11904.8 / 14770.8)	5550 / 6850 (12235.5 / 15101.4)

[ ] : Option

• The specifications and information above-mentioned may be changed without prior notice.
• For more details, please contact Doosan

Machine Specifications PUMA 2600 series

Description			Unit	PUMA 2600MS/LMS	PUMA 2600S/LS	PUMA 2600Y/LY	PUMA 2600SY/LSY
Capacity	Swing over bed		mm (inch)	780 (30.7)			
	Swing over front door		mm (inch)	680 (26.8)			
	Swing over saddle		mm (inch)	630 (24.8)			
	Recom. Turning diameter		mm (inch)	255 (10.0)			
	Max. turning diameter		mm (inch)	376 (14.8)	480 (18.9)	376 (14.8)	
	Max. turning length		mm (inch)	760 / 1280 (29.9 / 50.4)			
	Bar working diameter		mm (inch)	76 (3.0)			
Travels	Travel distance	X-axis	mm (inch)	260 [72+188] (10.2 [2.8+7.4])	260 [20+240] (10.2 [0.8+9.4])	260 [72+188] (10.2 [2.8+7.4])	
		Z-axis	mm (inch)	830 / 1350 (32.7 / 53.1)			
		Y-axis	mm (inch)	-		105 [±52.5] (4.13 [±2.065])	
		B-axis	mm (inch)	830/1350 (32.7/53.1)		-	830/1350 (32.7/53.1)
Feedrates	Rapid traverse	X-axis	m/min (ipm)	30 (1181.1)			
		Z-axis	m/min (ipm)	30 (1181.1)			
		Y-axis	m/min (ipm)	-		10 (393.7)	
		B-axis	m/min (ipm)	30 (1181.1)		-	30 (1181.1)
Main Spindle	Spindle speed (Belt Type)		r/min	3500			
	Spindle speed (Built-in)			-		4000	
	Spindle nose			ASA A2#8			
	Spindle bearing diameter (Front)		mm (inch)	140 (5.5)			
	Spindle through hole diameter		mm (inch)	86 (3.4)			
	Min. spindle indexing angle (C-axis)		deg	0.001	-	0.001	
Turret	No. of tool stations		st	12 [24]	12	12 [24] [16]	
	OD tool size		mm (inch)	25 [20] (1.0 [0.8])	25 (1.0)	25 [20] [25] (1.0 [0.8] [1.0])	
	Boring bar diameter		mm (inch)	50 [40] (2.0 [1.6])	50 (2.0)	40 [32] [32] (1.6 [1.3] [1.6])	
	Indexing time (1st swivel time)		s	0.15			
	Rotary tool spindle speed		r/min	5000	-	5000	
Tail stock	Quill diameter		mm (inch)	-		100 (3.9)	-
	Quill bore taper (Live)			-		MT#5	-
	Quill travel		mm (inch)	-		100 (3.9)	-
Sub-spindle	Spindle speed (Belt [Built-in])		r/min	4500 [-]		-	4500 [6000]
	Spindle nose			ASA A2-5		-	ASA A2-5
	Spindle bearing diameter (Front)		mm (inch)	90 (3.5)		-	90 (3.5)
	Spindle through hole diameter		mm (inch)	62 (2.4)		-	62 (2.4)
	Min. spindle indexing angle (C-axis)		deg	0.001		-	0.001
Motors	Main spindle motor		kW (Hp)	22 / 18.5 (29.5 / 24.8)			
	Sub spindle motor		kW (Hp)	7.5 / 5.5 (10.1 / 7.4)		-	7.5 / 5.5 (10.1 / 7.4)
	Rotary tool spindle motor		kW (Hp)	5.5 [7.5] (7.4 [10.1])	-	5.5 [7.5] (7.4 [10.1])	
	Coolant pump motor		kW (Hp)	0.4 (0.5)			
Power source	Electric power supply (Rated capacity)		kVA	51.65	48.86	46.4	54.55
Machine size	Machine height		mm (inch)	1900 (74.8)		2163 (85.2)	
	Machine dimension	length	mm (inch)	3600 / 4335 (141.7 / 170.7)		3600 / 4435 (141.7 / 174.6)	
		width	mm (inch)	1863 / 1965 (73.3 / 77.4)			
	Machine weight		kg (lb)	6000 / 7300 (13227.5 / 16093.5)	5850 / 7150 (12896.9 / 15762.8)	6000 / 7300 (13227.5 / 16093.5)	6450 / 7750 (14219.6 / 17085.6)

[ ] : Option

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• For more details, please contact Doosan

Machine Specifications PUMA 2600 series

Description			Unit	PUMA 2600/500	PUMA 2600M/500	PUMA 2600B/LB	PUMA 2600MB/LMB
Capacity	Swing over bed		mm (inch)	780 (30.7)			
	Swing over front door		mm (inch)	680 (26.8)			
	Swing over saddle		mm (inch)	630 (24.8)			
	Recom. Turning diameter		mm (inch)	255 (10.0)		305 (12.0)	
	Max. turning diameter		mm (inch)	480 (18.9)	376 (14.8)	480 (18.9)	376 (14.8)
	Max. turning length		mm (inch)	520 (20.5)		725 [1245] (28.5 [49.0])	
	Bar working diameter		mm (inch)	65 (2.6)		102 (4.0)	
Travels	Travel distance	X-axis	mm (inch)	260 [20+240] (10.2 [0.8+9.4])	260 [72+188] (10.2 [2.8+7.4])	260 [20+240] (10.2 [0.8+9.4])	260 [72+188] (10.2 [2.8+7.4])
		Z-axis	mm (inch)	590 (23.2)		830[1350] (32.7[53.1])	
		Y-axis	mm (inch)	-			
		B-axis	mm (inch)	-			
Feedrates	Rapid traverse	X-axis	m/min (ipm)	30 (1181.1)			
		Z-axis	m/min (ipm)	30 (1181.1)			
		Y-axis	m/min (ipm)	-			
		B-axis	m/min (ipm)	-			
Main Spindle	Spindle speed (Belt Type)		r/min	3500 (137.8)		2800 (110.2)	
	Spindle nose			ASA A2-8		A2-11	
	Spindle bearing diameter (Front)		mm (inch)	140 (5.5)		160 (6.3)	
	Spindle through hole diameter		mm (inch)	86 (3.4)		115 (4.5)	
	Min. spindle indexing angle (C-axis)		deg	0.001			
Turret	No. of tool stations		st	12	12 [24]	12	12 [24]
	OD tool size		mm (inch)	25 (1.0)	25 [20] (1.0 [0.8])	25 (1.0)	25 [20] (1.0 [0.8])
	Boring bar diameter		mm (inch)	50 (2.0)	50 [40] (2.0 [1.6])	50 (2.0)	50 [40] (2.0 [1.6])
	Indexing time (1st swivel time)		s	0.15			
	Rotary tool spindle speed		r/min	-	5000	-	5000
Tail stock	Quill diameter		mm (inch)	100 (3.9)			
	Quill bore taper (Live)			MT#5			
	Quill travel		mm (inch)	100 (3.9)			
Sub-spindle	Spindle speed (Belt [Built-in])		r/min	-			
	Spindle nose			-			
	Spindle bearing diameter (Front)		mm (inch)	-			
	Spindle through hole diameter		mm (inch)	-			
	Min. spindle indexing angle (C-axis)		deg	-			
Motors	Main spindle motor		kW (Hp)	18.5/15 (24.8/20.1)		22/18.5 (29.5/24.8)	
	Sub spindle motor		kW (Hp)	-			
	Rotary tool spindle motor		kW (Hp)	-	5.5 (7.4)	-	5.5 (7.4)
	Coolant pump motor		kW (Hp)	0.4 (0.5)			
Power source	Electric power supply (Rated capacity)		kVA	40.72	44.42	40.72	44.42
Machine size	Machine height		mm (inch)	1900 (74.8)			
	Machine dimension	length	mm (inch)	3370 (132.7)		3700 [4438] (145.7 [174.7])	
		width	mm (inch)	1863 (73.3)			
	Machine weight		kg (lb)	4900 (10802.5)	5000 (11023.0)	5500 [6800] (12125.2 [14991.2])	5650 [6950] (12455.9 [15321.9])

[ ] : Option

• The specifications and information above-mentioned may be changed without prior notice.
• For more details, please contact Doosan

Machine Specifications PUMA 2600 series

Description			Unit	PUMA 2600SB	PUMA 2600MSB	PUMA 2600YB	PUMA 2600SYB
Capacity	Swing over bed		mm (inch)	780 (30.7)			
	Swing over front door		mm (inch)	680 (26.8)			
	Swing over saddle		mm (inch)	630 (24.8)			
	Recom. Turning diameter		mm (inch)	305 (12.0)			
	Max. turning diameter		mm (inch)	480 (18.9)	376 (14.8)		
	Max. turning length		mm (inch)	725 (28.5)			
	Bar working diameter		mm (inch)	102 (4.0)			
Travels	Travel Travel distance	X-axis	mm (inch)	260 (10.2)	20+240 (0.8+9.4)	260 (10.2)	
		Z-axis	mm (inch)	830 (32.7)			
		Y-axis	mm (inch)	-		105 (4.1)	
		B-axis	mm (inch)	830 (32.7)		-	830 (32.7)
Feedrates	Rapid traverse	X-axis	m/min (ipm)	30 (1181.1)			
		Z-axis	m/min (ipm)	30 (1181.1)			
		Y-axis	m/min (ipm)	-		10 (393.7)	
		B-axis	m/min (ipm)	30 (1181.1)		-	30 (1181.1)
Main Spindle	Spindle speed (Belt Type)		r/min	2800 (110.2)			
	Spindle nose			ASA A2-11			
	Spindle bearing diameter (Front)		mm (inch)	160 (6.3)			
	Spindle through hole diameter		mm (inch)	115 (4.5)			
	Min. spindle indexing angle (C-axis)		deg	-	0.001		
Turret	No. of tool stations		st	12	12 [24]		
	OD tool size		mm (inch)	25 (1.0)	25 [20] (1.0 [0.8])		
	Boring bar diameter		mm (inch)	50 (2.0)	50 [40] (2.0 [1.6])		
	Indexing time (1st swivel time)		s	0.15			
	Rotary tool spindle speed		r/min	-	5000		
Tail stock	Quill diameter		mm (inch)	100 (3.9)			
	Quill bore taper (Live)			MT#5			
	Quill travel		mm (inch)	100 (3.9)			
Sub-spindle	Spindle speed (Belt [Built-in])		r/min	4500 (177.2)	-		4500 (177.2)
	Spindle nose			ASA A2#5	-		ASA A2#5
	Spindle bearing diameter (Front)		mm (inch)	90 (3.5)	-		90 (3.5)
	Spindle through hole diameter		mm (inch)	62 (2.4)	-		62 (2.4)
	Min. spindle indexing angle (C-axis)		deg	0.001	-		0.001
Motors	Main spindle motor		kW (Hp)	22/18.5 (29.5/24.8)			
	Sub spindle motor		kW (Hp)	7.5/5.5 (10.1/7.4)	-		7.5/5.5 (10.1/7.4)
	Rotary tool spindle motor		kW (Hp)	-	5.5 (7.4)		
	Coolant pump motor		kW (Hp)	0.4 (0.5)			
Power source	Electric power supply (Rated capacity)		kVA	48.86		46.40	54.55
Machine size	Machine height		mm (inch)	1900 (74.8)		2163 (85.2)	
	Machine dimension	length	mm (inch)	3700 (145.7)			
		width	mm (inch)	1863 (73.3)			
	Machine weight		kg (lb)	5950 (13117.3)	6100 (13448.0)	6100 (13448.0)	6550 (14440.1)

[ ] : Option

• The specifications and information above-mentioned may be changed without prior notice.
• For more details, please contact Doosan

Machine Specifications PUMA 3100 series

	Description		Unit	PUMA 3100/L/XL/UL	PUMA 3100M/LM/XLM/ULM	PUMA 3100Y/LY/XLY/ULY
Capacity	Swing over bed		mm (inch)	850 (33.5)		
	Swing over front door		mm (inch)	720 (28.3)* / 850 (33.5)**		
	Swing over saddle		mm (inch)	670 (26.4)		
	Recom. Turning diameter		mm (inch)	305 (12.0)		
	Max. turning diameter		mm (inch)	525 (20.7)	420 (16.5)	
	Max. turning length		mm (inch)	760 / 1280 / 2125 / 3125 (29.9 / 50.4 / 83.7 / 123.0)		
	Bar working diameter		mm (inch)	102 (4.0)		
Travels	Travel distance	X-axis	mm (inch)	293 [30.5+262.5] (11.5 [1.2+10.3])	293 [83+210] (11.5 [3.3+8.3])	
		Z-axis	mm (inch)	830 / 1350 / 2190 / 3190 (32.7 / 53.1 / 86.2 / 125.6)		
		Y-axis	mm (inch)	-		130 [±65] (5.1 [±2.6])
		B-axis	mm (inch)	-		
Feedrates	Rapid traverse	X-axis	m/min (ipm)	30 (1181.1)		
		Z-axis	m/min (ipm)	30 / 30 / 30 / 26 (1181.1 / 1181.1 / 1181.1 / 1023.6)		
		Y-axis	m/min (ipm)	-		10 (393.7)
		B-axis	m/min (ipm)	-		
Main Spindle	Spindle speed (Belt Type)		r/min	2800		
	Spindle speed (Built-in Type)		r/min	3000		
	Spindle nose			ASA A2#11		
	Spindle bearing diameter (Front)		mm (inch)	160 (6.3)		
	Spindle through hole diameter		mm (inch)	115 (4.5)		
	Min. spindle indexing angle (C-axis)		deg	0.001		
Turret	No. of tool stations		st	10	12	
	OD tool size		mm (inch)	25 (1.0)		
	Boring bar diameter		mm (inch)	50 (2.0)		
	Indexing time (1st swivel time)		s	0.15		
	Rotary tool spindle speed		r/min	-	5000	
Tail stock	Quill diameter		mm (inch)	100 / 100 / 120 / 120 (3.9 / 3.9 / 4.7 / 4.7)		
	Quill bore taper (Live)			MT#5		
	Quill travel		mm (inch)	100 / 100 / 120 / 120 (3.9 / 3.9 / 4.7 / 4.7)		
Sub-spindle	Spindle speed (Belt [Built-in])		r/min	-		
	Spindle nose			-		
	Spindle bearing diameter (Front)		mm (inch)	-		
	Spindle through hole diameter		mm (inch)	-		
	Min. spindle indexing angle (C-axis)		deg	-		
Motors	Main spindle motor		kW (Hp)	22 / 18.5 (29.5 / 24.8)		
	Sub spindle motor		kW (Hp)	-		
	Rotary tool spindle motor		kW (Hp)	5.5 [7.5] (7.4 [10.1])		
	Coolant pump motor		kW (Hp)	0.4 (0.5)		
Power source	Electric power supply (Rated capacity)		kVA	41.64 / 41.64 / 42.83 / 42.83	44.42 / 44.42 / 45.61 / 45.61	46.40 / 46.40 / 47.59 / 47.59
Machine size	Machine height		mm (inch)	2020 / 2020 / 2315 / 2315 (79.5 / 79.5 / 91.1 / 91.1)		2315 (91.1)
	Machine dimension	length	mm (inch)	3910 / 4530 / 5615 / 5685 (153.9 / 178.3 / 221.1 / 223.8)		
		width	mm (inch)	2002 / 2105 / 2280 / 2280 (78.8 / 82.9 / 89.8 / 89.8)		
	Machine weight		kg (lb)	5850 / 7350 / 10150 / 11650 (12896.9 / 16203.7 / 22376.6 / 23683.5)	6000 / 7500 / 10300 / 11800 (13227.5 / 16534.4 / 22707.3 / 26014.4)	6500 / 8000 / 10800 / 12300 (14329.8 / 17636.7 / 23809.6 / 27116.5)

* : PUMA 3100/M/L/LM/Y/LY   ** : PUMA 3100XL/UL/XLM/ULM/XLY/ULY [

] : Option

Standard feature

- Hydraulic power unit
- Lubrication equipment
- Coolant supply equipment
- Front guard door interlock
- Hydraulic chuck & actuating cylinder
- Soft jaws   • Foot switch
- Standard tool kit (tool holder & boring sleeve)
- Work light   • Manuals
- Levelling jack screw & plates
- Hand tool kit (including small tool for operations)
- Safety precaution name plates

Optional feature

- Additional tool holder & sleeves
- Air blast for chuck jaw cleaning
- Air gun
- Automatic door with safety device
- Bar feeder interface
- Dual chucking pressure
- Hardened & ground jaws
- Pressure switch for chucking pressure check
- High pressure coolant
- Oil skimmer
- Chip conveyor

- Chip bucket
- Programmable tail stock
- Servo driven tail stock
- Signal tower (yellow, red, green)
- Tail stock quill for dead center
- Tool pre-setter (Automatic type)
- Tool pre-setter (Manual type)
- Work ejector
- Parts catcher
- Parts conveyor
- Controller : Fanuc 31i

- The specifications and information above-mentioned may be changed without prior notice.
- For more details, please contact Doosan

NC Unit Specifications
Fanuc 31i

AXES CONTROL

- Controlled path	1 path [2 path]
- Controlled axes	X, Z, C, Y [C2, B]
- Simultaneous controlled axes	4 axes
- Angular axis control	
- Axis control by PMC	
- Backlash compensation	0 ~ ±9999 pulses
- Backlash compensation for each rapid traverse and cutting feed	
- Chamfering on / off	
- Cs contouring control	
- HRV2 control	
- Least input command	0.001 / 0.0001 mm/inch
- Machine lock	All axis / each axis
- Mirror image	
- Overtravel	
- Position switch	
- Stored pitch error compensation	
- Stored stroke check 1	
- Torque control	
- Interference chek for rotary area	
- Unexpected disturbance torque detection function	

OPERATION

- Automatic operation (memory)	
- MDI operation	
- DNC Operation with Memory card	
- Buffer register	
- Dry run	
- Handle incremental feed	X1, X10, X100
- Program restart	
- Wrong operation prevention	
- JOG feed	
- Manual handle feed	1unit
- Manual intervention and return	
- Manual pulse generator	1 ea
- Manual reference position return	
- Program number search	
- Refernce position setting without dog	
- Sequence number search	
- Single block	

INTERPOLATION FUNCTIONS

- Nano interpolation	
- Positioning	G00
- 1st. Reference position return	Manual, G28
- 2nd. reference position return	G30
- Circular interpolation	G02
- Continuous threading	
- Cylindrical interpolation	
- Dwell (per sec)	G04
- Linear interpolation	G01
- Multiple threading	
- Polar coordinate interpolation	
- Helical interpolation	
- Reference position return check	G27
- Skip	G31
- Thread cutting / Synchronous cutting	
- Thread cutting retract	
- Torque limit skip	

FEED FUNCTION

- Automatic acceleration / deceleration	
- Cutting feedrate clamp	
- Feed per minute	
- Feed per revolution	
- Feedrate override (10% unit)	0 - 200 %
- Jog feed override (10% unit)	0 - 2000 mm/min
- Manual per revolution feed	
- Override cancel	
- Rapid traverse override	F0, 25, 100 %
- Tangential speed constant control	

AUXILIARY / SPINDLE SPEED FUNCTION

- Spindle orientation	
- Actual spindle speed output	
- Auxiliary function lock	
- Constant surface speed control	
- M-code function M3 digits	M3 digits
- Multi spindle control	
- Rigid tapping	
- S-code function	S4 / S5 digits
- Spindle serial output	S4 / S5 digits
- Spindle speed override	0 - 150 %
- Spindle synchronous control	

- Spindle Output switching	

PROGRAM INPUT

- Absolute / incremental programming	
- Addition of custom macro common variables	
	#100~#199, #500~#999
- Automatic coordinate system setting	
- Canned cycle for drilling / Turning	
- Canned cycle	
- Circular interpolation by R programming	
- Control in/out	
- Coordinate system setting	G50
- Coordinate system shift	
- Custom macro	
- Decimal point programming / Pocket calculator type decimal point programming	
- Diameter/radius programming	(X axis)
- Direct drawing dimension programming	
- Direct input of coordinate system shift	
- G code system A	
- G code system B/C	
- Input unit 10 time multiply	
- Label skip	
- Macro executor	
- Manual absolute on and off	
- Maximum program dimension	±9 digit
- Multiple repetitive canned cycle	G70 - G76
- Multiple repetitive canned cycle II	
- Optional block skip	9 piece
- Parity check	
- Plane selection	G17, G18, G19
- Program file name	32 characters
- Program stop / end(M00, M01 / M02, M30)	
- Programmable data input	G10
- Sequence number	N8 digit
- SUB program call	10 folds nested
- Tape code : ISO / EIA auto recognition	EIA auto recognition
- Tape format for FANUC Series15	
- Work coordinate system	G52 - G59

TOOL FUNCTION / TOOL COMPENSATION

- Automatic tool offset	
- Direct input of offset value measured	
- Direct input of offset value measured B	
- T-code function	T2+2 digits
- Tool geometry / wear compensation	
- Tool life management	
- Tool Load Monitoring system *	
- Tool nose radius compensation	
- Tool offset	G43, G44, G49
- Tool offset pairs	±6 digits : 32 pairs
- Tool offset value counter input	
- Y-axis offset	

EDITING OPERATION

- Back ground editting	
- Extended part program editing	
- Memory card edit & operation	
- Number of registered programs	500 ea
- Part program editing	
- Part program storage size	640 (256 Kbyte) m
- Program protect	

SETTING AND DISPLAY

- Actual cutting feedrate display	
- Alarm display	
- Alarm history display	
- Current position display	
- Periodic maintenance screen	
- Display of spindle speed and T code at all screens	
- Help function	
- Multi-language display	
- Operation history display	
- Parameter setting and display	
- Program comment display	31 characters
- Run hours / part count display	
- Self-diagnosis function	
- Servo setting screen	
- Spindle setting screen	
- Status display	
- Operating monitor screen	
- Servo waveform display	

DATA INPUT / OUTPUT

- External key input	
- External data input	
- External work number search	15 points
- Memory card input/output	
- Reader/puncher interface	CH1.interface
- RS232C interface	
- Automatic data backup	
- Screen hard copy	

OTHERS

- Cycle start and lamp	
- Display unit	10.4" Color LCD
- Feed hold and lamp	
- NC and servo ready	
- PMC system	31iA-PMC
- Reset / rewind	

INTERFACE FUNCTION

- Ethernet function	Embedded ethernet

OPERATION GUIDANCE FUNCTION

- EZ Guidei (Conversational Programming Solution)	

OPTIONAL SPECIFICATIONS

AXIS CONTROL

- Stored stroke 2 and 3	
- Stroke limit check before move	

OPERATION

- DNC operation(Reader/puncher interface is required)	
- Manual handle feed	2 units
- Manual handle interruption	
- Reference position shift	
- Tool retract and recover	

INTERPOLATION FUNCTIONS

- 3rd / 4th reference point reurn	
- Circular threading	
- Multi step skip	
- Polygon machining with two spindle	
- Variable lead threading	

FEED FUNCTION

- External deceleration	
- Feed stop	
- AI Contour control I (Look-ahead block no. is Max.30)	G5.1 Q1

AUXILIARY / SPINDLE SPEED FUNCTION

PROGRAM INPUT

- Addition of workpiece coordinate system pair	48 pairs
- Automatic corner override	
- Interruption type custom macro	
- Optional block skip (Soft operator's panel)	9 pieces
- Pattern data input	
- Work coordinate system preset	

TOOL FUNCTION / TOOL COMPENSATION

- Addition of tool pairs for tool life management	128 pairs
- Tool offset pairs	64 / 99 / 400 / 999 pairs

EDITING OPERATION

- Number of registered programs	1000 (512KB) ea
- Part program storage length	1280 / 2560 / 5120 m
- Play back	

SETTING AND DISPLAY

- Directory display of floppy cassette	

DATA INPUT/OUTPUT

- Fast ethernet / Data server	Only for 1 path
- Remote buffer	Only for 1 path

ROBOT INTERFACE

- Robot interface with PMC I/O module} (Hardware between PMC I/O mudules)	
- Robot interface with PROFIBUS-DP	

[ ] : PUMA 2100/2600 SY/LSY only

* : According to the business contract made Doosan,
some regions have
"Tool Load Monitoring system" as option.

NC Unit Specifications

DOOSAN-Fanuc i series

AXES CONTROL

- Controlled path	1 path [2 path]
- Controlled axes	X, Z, C, Y [C2, B]
- Simultaneous controlled axes	4 axes
- Axis control by PMC	
- Backlash compensation	0 ~ ±9999 pulses
- Backlash compensation for each rapid traverse and cutting feed	
- Chamfering on / off	
- Cs contouring control	
- HRV2 control	
- Least input command	0.001 / 0.0001 mm/inch
- Machine lock	All axis / each axis
- Mirror image	
- Overtravel	
- Stored pitch error compensation	
- Stored stroke check 1	
- Chuck and tail stock barrier	
- Stored stroke 2 and 3	
- Stroke limit check before move	
- Torque control	

OPERATION

- Automatic operation (memory)	
- MDI operation	
- DNC Operation with Memory card	
- Dry run	
- Handle incremental feed	X1, X10, X100
- Program restart	
- Wrong operation prevention	
- JOG feed	
- Manual handle feed	1unit
- Manual intervention and return	
- Manual reference position return	
- Program number search	
- Refernce position setting without dog	
- Sequence number search	
- Single block	
- DNC operation (Reader / puncher interface is required)	
- Manual handle interruption	
- Reference position shift	

INTERPOLATION FUNCTIONS

- Nano interpolation	
- Positioning	G00
- 1st. Reference position return	Manual, G28
- 2nd. reference position return	G30
- Circular interpolation	G02
- Continuous threading	
- Cylindrical interpolation	
- Dwell (per sec)	G04
- Helical interpolation	
- Linear interpolation	G01
- Multiple threading	
- Polar coordinate interpolation	
- Reference position return check	G27
- Skip	G31
- Thread cutting / Synchronous cutting	
- Thread cutting retract	
- Torque limit skip	
- 3rd / 4th reference point reurn	
- Polygon machining with two spindle	
- Variable lead threading	

FEED FUNCTION

- Automatic acceleration / deceleration	
- Cutting feedrate clamp	
- Feedrate override (10% unit)	0 - 200 %
- Jog feed override (10% unit)	0 - 2000 mm/min
- Override cancel	
- Rapid traverse override	F0, 25, 100 %

AUXILIARY / SPINDLE SPEED FUNCTION

- Spindle orientation	
- Actual spindle speed output	
- Auxiliary function lock	
- Constant surface speed control	
- M-code function	M3 digits
- Multi spindle control	
- Rigid tapping	
- S-code function	S4 / S5 digits
- Spindle serial output	S4 / S5 digits
- Spindle speed override	0 - 150 %
- [Spindle sychronous control]	

PROGRAM INPUT

- Absolute / incremental programming	
- Addition of custom macro common variables	#100~#199,#500~#999
- Automatic coordinate system setting	
- Canned cycle for drilling / Turning	
- Circular interpolation by R programming	
- Coordinate system setting	G50
- Custom macro	
- Pocket calculator type decimal point programming	
- Diameter/radius programming (X axis)	
- Direct drawing dimension programming	
- Direct input of coordinate system shift	
- G code system A / B / C	
- Label skip	
- Macro executor	
- Manual absolute on and off	
- Maximum program dimension	±9 digit
- Multiple repetitive canned cycle	G70 - G76
- Multiple repetitive canned cycle II	
- Optional block skip	9 piece
- Parity check	
- Plane selection	G17, G18, G19
- Program file name	32 characters
- Program stop / end (M00, M01 / M02, M30)	
- Programmable data input	G10
- Sequence number	N8 digit
- SUB program call	10 folds nested
- Work coordinate system	G52-G59
- Interruption type custom macro	
- Optional block skip	9 piece
- Pattern data input	

TOOL FUNCTION / TOOL COMPENSATION

- Automatic tool offset	
- T-code function	T2+2 digits
- Tool geometry / wear compensation	
- Tool life management	
- Tool Load Monitoring system *	
- Tool nose radius compensation	
- Tool offset	G43, G44, G49
- Tool offset pairs	±6 digits : 64 pairs

- Tool offset value counter input	
- Y-axis offset	

EDITING OPERATION

- Number of registered programs	400 ea
- Part program editing	
- Part program storage size	1280m (512kB)
- Play back	

SETTING AND DISPLAY

- Alarm history display	
- Multi-language display	
- Program comment display	31 characters
- Run hours / part count display	
- Self-diagnosis function	
- Operating monitor screen	

DATA INPUT / OUTPUT

- External work number search	15 points
- Memory card input/output	
- RS232C interface	
- Automatic data backup	
- Screen hard copy	

OTHERS

- Cycle start and lamp	
- Display unit	10.4" Color LCD
- Feed hold and lamp	
- MDI unit	
- NC and servo ready	
- PMC system	

INTERFACE FUNCTION

- Ethernet function	Embedded ethernet

OPERATION GUIDANCE FUNCTION

- EZ Guidei (Conversational Programming Solution)	

OPTIONAL SPECIFICATIONS

INTERPOLATION FUNCTIONS

- Multi step skip	

FEED FUNCTION

- Advanced preview control	

TOOL FUNCTION / TOOL COMPENSATION

- Tool offset pairs	99 / 200 pairs

DATA INPUT / OUTPUT

- Fast ethernet / Data server	Only for 1 path

ROBOT INTERFACE

- Robot interface with PMC I/O module (Hardware between PMC I/O mudules)	
- Robot interface with PROFIBUS-DP	

[ ] : PUMA 2100/2600 SY/LSY only
* : According to the business contract made Doosan, some regions have "Tool Load Monitoring system" as option.

![DOOSAN logo]

Doosan Machine Tools

Optimal Solutions for the Future

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